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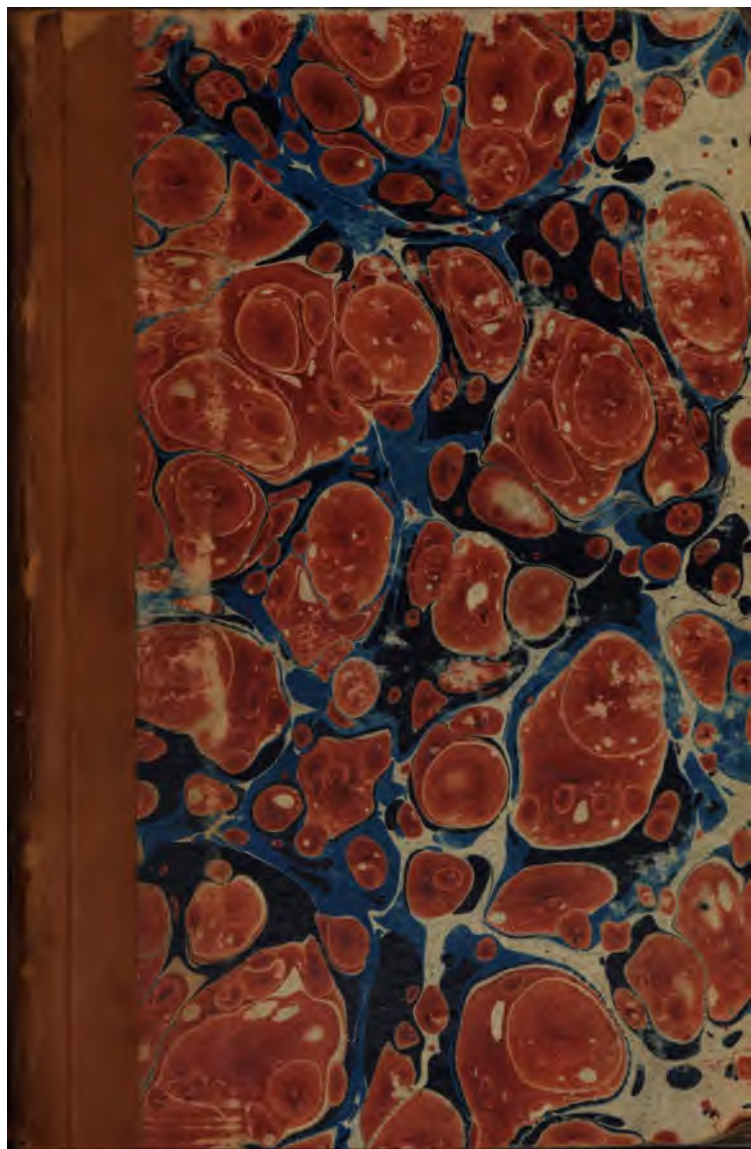
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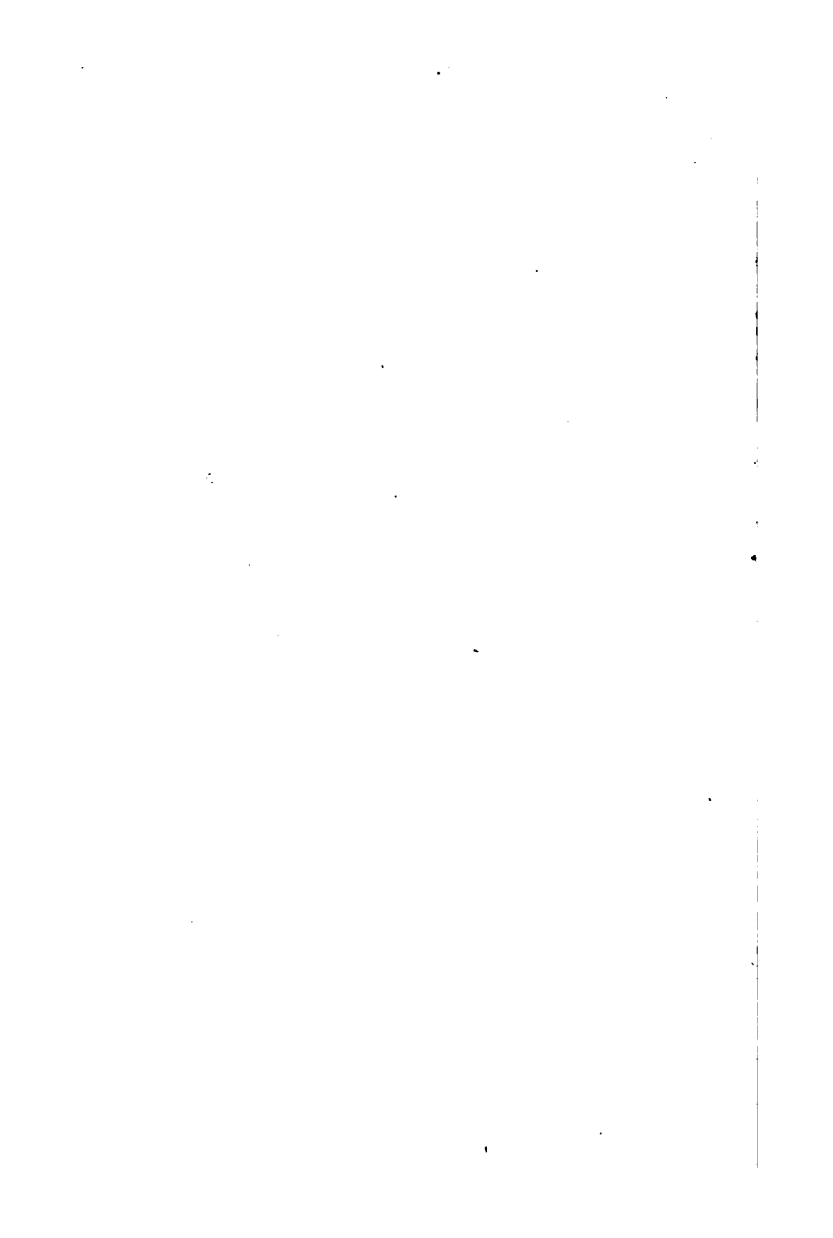


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SKETCHES
OF THE
ANIMAL AND VEGETABLE PRODUCTIONS
OF
A M E R I C A .

BY

MARY ROBERTS,

AUTHOR OF

"DOMESTICATED ANIMALS" AND "WILD ANIMALS."



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PREFACE.

WRITERS on Natural History have spoken concerning the animals and plants of different zones and climates indiscriminately; I venture to separate them, and to select from among the forests and savannas of the New World such as most especially illustrate the wisdom and beneficence of their Creator. These sketches will not be confined merely to the details of Natural History; they will comprise whatever is most beautiful or curious, either in the scenery by which the subjects of them were surrounded, or in their wonderful adaptation to the sites which they are designed to occupy.

I may not venture to assert that this idea is exclusively my own, yet, assuredly, it has not been generally adopted; for the history of plants has, in

most cases, been separately treated, that of animals also, as well as scenery. But the uniting of them will better suit my purpose; for how much more beautiful is the effect produced by the concentration of many rays of light than by the separation of one prismatic colour, however brilliant.

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ERRATA.

- Page 65, line 3, *for Faira, read Taira.*
— 67, — 27, *for rebsort, read resort.*
— 92, — 16, *for palma christis, read palma christi.*
— 103, — 1, *for This graceful tree, read The American acacia.*
— 207, — 11, *for minds, read mind.*

THE
ANIMAL AND VEGETABLE PRODUCTIONS
OF
AMERICA.

WHEN America was first discovered, her natural historians did not scruple to assert that the principle of life seemed less active than in the ancient continent. They maintained that, notwithstanding the vast extent of the new world, its diversity of climate and soil, of vegetable productions, and atmospheric influence, the animal inhabitants were fewer in proportion than those which peopled the other hemisphere; that in the islands there were only four kinds of quadrupeds, the largest of which did not exceed in size a common rabbit; and that, throughout the continent, although the variety was greater, and the individuals proportionably numerous, yet the number of distinct species was still extremely small. They further asserted, that of two hundred different kinds of animals spread over the surface of the earth, only one-third existed in America at the time of her discovery. Nor were they contented thus to diminish the number of the native species; they also contended, and Buffon has industriously dissemi-

nated the opinion, that all, and each, were strikingly inferior, both in sagacity and size, to those of the ancient world. In proof of which it was asserted, that America, throughout the whole extent of her vast savannas, and interminable forests, sheltered no one creature of such bulk as the elephant or camel. But the reason of this is obvious; their services are unnecessary. In the new world cold predominates. The rigour of the frigid zone extends over half those regions that should be temperate by reason of their position; countries where the fig and grape should ripen, are chilled with perpetual frost. Newfoundland, part of Nova Scotia, and Canada, lie in the same parallel with the finest provinces of France, yet how great the difference between them! In one, corn-fields and vineyards abound; in the other, the ground is covered in many parts with deep snow, and the great river St. Lawrence is frozen at a season when the waters of the Thames and the Seine are usually free from ice. The rein-deer, that useful animal, from whom the natives of the arctic regions derive the greatest benefit, and whose constitution supports and even requires the most intense cold, abounds in Canada, though unable to exist in any country to the south of the Baltic. The same comparison holds good between the Esquimaux part of Labrador, the countries south of Hudson's Bay, and Great Britain; the last is highly cultivated, and enriched with flocks and herds, but in the former the cold is so intense, that even European industry has not availed to ameliorate the soil. As we advance towards those portions of America, which are similarly situated with many African and Asiatic pro-

vines, that enjoy such a degree of warmth as is most friendly to life and vegetation, the dominion of cold continues, and winter reigns, though only during a short period, with extreme severity. If we pass from the continent of America into the torrid zone, we shall perceive the frigid character of the new world extending its unconquerable influence even to this region of the globe, and mitigating the excess of its fervour. While the negro on the coast of Africa is scorched with unremitting heat, the inhabitant of Peru breathes an air equally mild and temperate, beneath a canopy of gray clouds, which intercepts the fierce beams of the sun, without obstructing his kindly warmth. Throughout the eastern coast of America, the climate, though assimilating more to that of the torrid zone, in the elder continents, is nevertheless considerably milder. In treading her vast savannas, the traveller never complains of that intolerable heat which perpetually arrests his progress in those parts of Africa and Asia which lie in the same latitude. It is, therefore, obvious that neither the elephant nor camel are required in this milder portion of the globe, but instead of these the llama overspreads her fertile plains; nor are there wanting in the depth of her interminable forests, on the rugged flanks of the vast Andes, on the shores of her sea-like Plata, Orinoco, and Amazon, creatures, though perhaps less specifically numerous than those of the ancient continents, yet equally serving the purposes of man.

Another reason may also be assigned for the apparent smallness of their numbers.

Natural history is the boast of modern times.

The first discoverers of America were generally adventurers, drawn thither by the thirst of gold, while her historians spoke rather of the minerals which she concealed in her bosom, the rich productions of her soil, the habits and the manners of the natives, than of such animals as immediately surrounded them. If they endeavoured to penetrate her forests, the aborigines fled from the thunder of their guns; if they roused, in her savannas, the nimble elk, the caraboa, jaguar, or racoon, they, swift of foot, and readily alarmed by any unusual sound, found a retreat amid the luxuriance of their native fastnesses, thus precluding the possibility of ascertaining either specific or numerical varieties.

The natives, too, as they required not the aid, had subjugated few of the animals which surrounded them; and hence it was not surprising that the first historians of America, men whose sources of information were extremely limited, should represent the four-footed population as inferior to those of the countries with which they were acquainted.

But in proportion to the increase of geographical knowledge, and the progress of zoological science, in the older portions of the globe, has been the research of naturalists in the new. Men of very different pretensions from the earlier discoverers of America, have made themselves acquainted with the animals of either continent; as unknown countries opened to their view, unknown species were found to inhabit them. Even at the present day, and, notwithstanding the improved state of knowledge in regard to the earth's surface, there is reason to conjecture that zoology is still in its infancy, espe-

cially when we reflect on the *terra incognita* of Africa, America, and even Asia; of New Holland, and the islands of the Pacific Ocean, without advertent to the new, and almost daily discoveries and wonders of fossil osteology.



URSINE HOWLING MONKEY, (*Simia Urstina*.)

In speaking of Transatlantic animals, we will commence with the Alouattes, or Howling Monkeys, the Baboons of the new world. They approximate in size and fierceness to their African and Asiatic brethren, and are, perhaps, still less amenable to the discipline of man. They are dis-

tinguished for wildness and ferocity, and the bony structure of their throats, which gives them such tremendous power of sound, and adds in no small degree to the terror which they are calculated to inspire. He who visits their deep primeval haunts often encounters whole troops of these nightly wanderers, who make the forests resound with their dreadful yells. They love darkness, and rarely venture out when the sun shines; nor do they go alone, but in strong detachments; and the moment they discover an intruder, it is not the voice of either one or two that calls forth the echoes. The whole troop howls fearfully, and in concert.

Humboldt, the celebrated transatlantic traveller, saw, for the first time, these formidable inhabitants of her ancient forests, after landing at Cumana, in the province of New Andalusia. He fell in with them during an excursion to the mountains of Cocola, and the caverns of Guacharo, the resort of innumerable birds. Although the convent of Caripe, where he rested, is situated in a valley at an elevation of more than four thousand toises above the level of the sea, and was in consequence very cold, yet the surrounding woods abounded with Howling Monkeys, whose melancholy voices were heard at the distance of two miles, especially when the nights were clear.

Certain tribes of these strange foresters are without a thumb on the fore-paw; and two species are known which have this appendage in a rudimental state.

These animals are evidently designed to live on trees, for nothing can be more embarrassing than

their movement on the ground. Unable to bound or leap, they rather drag themselves along than walk, by advancing their long legs and arms alternately, and endeavouring to preserve an equilibrium by clinging with their tails to the trunks of trees. But in proportion to their slow and embarrassed movements on the earth, so are they alert and active in the forests, where they are often seen to traverse even the smallest branches with inconceivable rapidity. They dart from one tree to another, even when separated by a considerable interval, and as they subsist principally on fruit, they rarely have occasion to descend from their places of resort, except in quest of water.

There is much kindness in their disposition, for they live in small communities, and assist one the other. Should any traveller intrude on their domain, in places where they have not learned to fear the face of man, they pelt him with stones and branches. Doubtless they act thus every time they see a new object, but the instinct by which they are excited rather impels them to menace and disturb, than to attack the intruder in close combat. They act as if they wished to repress the audacity of him who would penetrate through the intricacies of their green-wood shades, and probably, with animals in general, this method of proceeding answers the desired purpose. But should the intruder be more formidable than they at first supposed, should he, regardless of their ancient prerogative, fire at, or otherwise injure, an Howling Monkey, the rest betake themselves to the topmost boughs, and make the woods resound with lamentable cries. The

wounded animal, meanwhile, presses his finger on the injured part, and looks steadily at the flowing of the blood, until, through weakness, he loses all consciousness of suffering, and expires. He then slips off the branch on which he sat, but generally remains suspended by the tail, which in times of danger, is coiled round the nearest bough.

These animals are easily domesticated. The regard which they evince one towards the other is soon transferred to their masters, and caresses and good treatment render them remarkably affectionate. It is even said that they have been taught to perform domestic offices.

The Large Red Monkey, the *S. siniculus* of De-merara, is also a tremendous howler. Nothing can be more dreadful than his nocturnal yells. The traveller who, lying in his hammock, amid gloomy immeasurable wilds, hears him at intervals from eleven o'clock till daybreak, might suppose that innumerable wild beasts were collecting for the work of carnage. Now, he seems to listen to the terrific roar of the Jaguar, as he springs on his prey; now, the sound changes to his deep-toned growlings, as he is pressed on all sides by superior force; and now, you hear his last dying moan, beneath a mortal wound. Some naturalists suppose that these awful sounds, which resemble those of enraged or suffering wild beasts, proceed from a number of Red Monkeys, when howling in concert. But an individual readily produces this variety of intonations, aided by the peculiar structure of the trachea. In dark and cloudy weather, and just before a squall of wind or rain, this monkey will often howl in the

day-time; and if you advance cautiously beneath the high tufted tree where he is sitting, you may observe the ease with which he produces those discordant sounds.

Red Monkeys abound in the wildest parts of Demerara. They may be seen on the topmost boughs of the towering mora, when it rises, bleached with age, above the young green foliage of the forest, or garnished with parasitic leaves and verdure. The wild fig-tree, large as a common apple-tree, often rears itself from one of the thick branches, and when its fruit is ripe, innumerable birds resort thither, as to an annual banquet. The wind, that random sower, first planted it, in some hole made by the woodpecker, and there, nested in the wood, and nourished by the sap of the parent tree, it grew rapidly, till, emerging forth into full bearing, it also contributed a portion of its own juices to the growth of different kinds of vine, the seeds of which had been likewise deposited in its branches. These quickly vegetated and bore fruit in abundance. Then the stately mora, unequal to support the usurpation of the fig-tree, faded beneath the burden; the fig-tree also, having no root of her own, and being unable to draw nourishment from the sapless trunk, gradually declined, till her usurping progeny of vines, receiving no further aid, failed and withered in their turn. Thus they stand like pyramids of dried boughs, in striking contrast to the beauty and luxuriance of the forest. Yet the Toucan often perches on them; Parrots, too, and the Red Monkey, gambol among the dry branches. A looker-on might almost fancy that the one delighted to con-

with her brilliant colours with the sear and faded leaves; the other his active and vigorous spring with that bleached trunk and branches, which, destitute of sap, and ungarnished with leaves and flowers, can wave no more in the soft summer breezes or autumnal wind.

From the structure of the Monkey tribe, more especially from the formation of their limbs, the idea of petulance and activity is generally associated with them. Were we desirous to represent an animal of sluggish movements, we should invest it with short limbs and a thick body; and we should not expect to discover a wild creature favourably organized for active exertion, yet slow and embarrassed in its movements. But in science, one fact is frequently sufficient to overthrow the most plausible theory, even when apparently the result of patient research and actual discovery. Thus, for example, the Coaita (*S. paniscus*), or Four-fingered Monkey, a creature better constructed for active and vivacious movements than almost any of his tribe, which has longer limbs and a tail that answers the purpose of a hand, moves slowly. It seems an effort to change his position, and he acts as if he required a new impulse of the will for every new movement. Yet this animal is far from being devoid of intelligence. He possesses it even in a higher degree than many of the Monkey tribe, blended with a considerable degree of penetration, and the mildest and most affectionate temper.

The tribe of which he is a member, inhabits the forest parts of Guiana and Brazil. They carefully avoid the equatorial regions, which are subject to

great rains, and variable winds, but delight in the serene and wholesome climate of the south. You may see them bounding from branch to branch among the delicate white blossoms of the *Cassalpinia brasiletto*, or Brazil wood, which are numerous in the country to which they gave a name. You may also watch their agile movements along the bush ropes in the great forests of Demerara, which serve as step-ladders from one tree to another. These amazing cables, which are sometimes nearly as thick as a man's body, may be seen either twisting like corkscrews round a lofty tree, and lifting their heads above its summits, or joining tree to tree, and branch to branch. Others, descending from a topmost bough, or drooping from out the fissure of some high rock, take root as soon as they touch the ground, and appear like shrouds and stays supporting the main-mast of a line-of-battle ship; while others, sending out parallel, oblique, or horizontal shoots, remind you of what travellers call a matted forest. Oftentimes a tree, uprooted by the whirlwind, is stopped in its fall, at perhaps an elevation of a hundred feet, by one of these natural cables. Hence it is that travellers account for the phenomenon of seeing trees not only alive, but yielding leaves and fruit, though far from perpendicular, and with their trunks inclined to every degree from the meridian to the horizon. Thus upheld, their heads remain firmly supported by the bush-rope, while the roots soon refix in the earth; and frequently a shoot rises from near the base of the inclined trunk, and in time becomes a fine tree. Numerous wild animals are seen to gambol up and

down these natural rope-ladders; playful squirrels, the monkeys of which we have just spoken, raccoons, bisas, and sacawinkes, rove from tree to tree; while beneath, the small ant-bear, and his larger brother, remarkable for a long and bushy tail, fix their abode for the sake of the wood-ants, whose little hillocks appear in all directions; armadilloes bore in the sand-hills, and the porcupine is occasionally discovered on the lower branches.

Monkeys are sociable creatures. They often descend from their rocky fastnesses to bathe in the mountain rivulets, and to gather the ripe fruits that grow beside them; yet they rarely venture far from some steep crag, or precipice, that, in case of danger, they may readily escape; and while they are enjoying the abundance of the rich alluvial valleys, sentinels are stationed on elevated places, to give timely warning should an enemy approach.

Those who journey through the valleys of the Andes often come unexpectedly upon a company of monkeys quietly congregated in some retired nook. The party not unfrequently consists of forty or fifty, of all ages and dispositions; some grave and moralizing, others playing with their young, others sporting in the stream, and some that appear half-grown pursuing one the other in playful gambols. But the moment that a stranger is seen approaching, a loud cry is raised by the sentinels, and off the party troop, hobbling on all-fours after their awkward fashion—for they are not constructed to run readily upon the ground—or splashing through the stream, or scrambling with incredible agility up the rocky cliffs, which are often nearly perpendicular, and rise

to an elevation of many hundred feet. On these occasions, the males are remarkable for their consideration towards their mates; no one, like *Æneas*, runs first, and leaves his unprotected *Creusa* to follow after. They uniformly bring up the rearguard, while the females, climbing, chattering, or squalling, with their young ones in their arms, or on their backs, hasten before. It is highly amusing to watch a company thus decamping. The young ones cling affrighted to their mothers, the mothers appear intent only on effecting their escape, stripping monkeys seem as if they enjoyed the sport, but the fathers occasionally look back with angry menaces, defying any one to follow; and some of the old grandfathers, when they get upon the rocks, and feel secure from pursuit, make the valleys ring with their angry vociferations, and heartily scold the traveller who has dared to intrude upon them.

In speaking of the monkeys of America, the natural historian has often to regret the meagreness of his details. He knows them, indeed, by their generic appellations, for the indefatigable Cuvier has given to each a name as well as a locality, but he is continually reminded that the impossibility of ascertaining their wild habits renders it extremely difficult to furnish such details as might interest the general reader.

Few particulars have reached us concerning the *Ouistilis*, or Striated Monkey (*S. jacchus*). He is well known in a captive state, but little has been ascertained respecting him while ranging through his native wilds.

Cuvier gives a pleasing account of two of these animals and their offspring, as occupants of the menagerie of Paris. The young were exceedingly affectionate to their mother; they used to cling round her neck, and when alarmed would endeavour to hide themselves in her warm fur. When tired with carrying them, she would go to the male, and utter a soft plaintive cry; he understood her meaning, and immediately took them in his paws, or else placed them on his back; and they, on their part, well knew how to hold fast, while he carried them about till they grew hungry. He then returned them to their mother, who shortly gave them back again. Indeed, the burden of their nurture seemed principally to devolve upon the father. He did his best, and seemed very fond of his young charge, but she did not show to them that degree of tenderness and affection which is common to the females of most species; or, perhaps, being unable to partake of the wild gambols in which she used to delight, her health and spirits might be unequal to the task. Perhaps, even, a sad remembrance of her native forests might imbitter her maternal feelings; she might have little pleasure in nursing those young creatures who were thus early deprived of their freedom. Be this as it may, they both died young, one at a month old, the other a week after.

Those who consider animals merely as automata, formed of bone and muscle, going on four legs, and covered with fur or wool, may deride the idea of thought, and memory, and feeling, being assigned to a Striated Monkey; yet such is un-

doubtedly the case. Why else does the dog recognise his master? Why is he often seen to look depressed when that master is away, and to start up; all bustle and animation, when his step is heard? Why did the camelopard appear delighted when he recognised among the crowd a native of the country whence he came, if the sight of him did not call up past scenes, and the recollection of the boundless plains on which his eyes first opened to the light? Whence, if the animal had not memory, gratitude too, and the delight arising from the presence of a benefactor, were the emotions shown by the lion of Androcles, in ancient times; in modern ones, the joy evinced by the noble tiger at Oatlands, on hearing the well-known voice of the soldier who had taken care of him during his voyage from India? We have degraded the animals over whom the Most High has given man supremacy, by considering them as solely occupied in providing for their wants; or, when domesticated, as only ministering to ourselves. Man, formed in the image of his Maker, stands pre-eminent at the head of creation—the Lord breathed into him the breath of life, and he became a living soul; while out of the ground were formed every beast of the field, and every fowl of the air, and these were successively named by Adam as they passed before him. Yet even to them much is given, and whoever is acquainted with their habits must acknowledge the difficulty of distinguishing between that which we term instinct and a certain portion of reason. Their Creator has assigned to them not only the capability of fear and love, gratitude, memory, and the desire to avoid suf-

fering, but the faculty of knowing how to provide against evils or even to afford assistance when circumstances make it necessary ; and a readiness also to profit by experience, either as regards themselves or others. Take, for example, the instance of the St. Bernard dog, who, when sitting at the door of the monastery, saw a poor woman pass by with a young child, and who immediately got up, and followed her till she was overtaken by a snow-storm, upon which he ran back with all speed to procure assistance ; that of the cat, who, in jumping upon a chair, had fallen through it in consequence of the seat being taken out, and who would never again seat herself on one without standing on her hind legs to see if all was safe ; and, lastly, the fact related of an elephant, who rescued an officer from the paws of an enraged lion, by bending down across the body of the animal a young tree, which pinned him to the ground, and constrained him from excessive pain to let go his hold.

But what good, it may be asked, can be derived from considerations which thus tend to raise brute animals in the scale? Much in every way. We are taught, by the knowledge of facts, that animals are susceptible not only of bodily, but mental distress ; and hence our own happiness is enhanced by promoting theirs. We are saved from sins of ignorance, and induced to show kindness to those whom the Lord has placed below us, and whom He has given for our use. We are admonished that to inflict on these unnecessary pain, whether bodily or mental, must be displeasing in the sight of Him who is not unmindful of the humblest of his

creatures ; for is it not said in Holy Writ that the mother and her young shall not both be offered unto the Lord in one day*? The Most High has here regard to the feelings—to the *affections*—of the animals which He made. He recognises the mutual attachment of the parent and the offspring, and he would not permit either the one or the other to be needlessly distressed.

Wild animals are undoubtedly much happier than the domesticated species, because man has not yet learned that he is appointed, not the oppressor, but the benefactor of his dependents ; yet when brought into subjection, and kindly treated, they very commonly choose rather to follow him than to associate with their companions. This peculiarity is very obvious in the species of which we have now to speak, the Merikana (*S. rosalia*, *vul.*), Lion Monkey, and the Squirrel Monkey (*S. sciurea*).

The Merikana is a pretty little animal, with an intelligent physiognomy, and light and graceful movements ; he utters a soft and plaintive sound, and his disposition is remarkably pleasing. The only defensive weapons which he possesses are his teeth, but he does not require any other. He lives at peace with all his neighbours, and should a dispute unexpectedly arise, he seems to consider that it is better to avoid hostilities than to return them. He therefore springs into the nearest citadel of boughs, and remains concealed till their displeasure has had time to cool.

When in a captive state, much care is requisite to guard him from atmospheric changes. Cold and

* Levit. xxii. 27, 28.

damp, are injurious to his health; and as he is fastidiously neat, the greatest attention can hardly satisfy him. Dirt and negligence annoy him beyond measure, he loses his gaiety, lays aside his endearing ways, and sinks into the deepest melancholy. Remove the annoyance, and he resumes his cheerfulness; his face brightens up, and he knows not how sufficiently to express his thanks. Let it remain, and the Merikana gambols no longer; he will even pine away and die. Equally delicate with respect to eating, it is difficult to provide him with proper food. Nor can he live alone; solitude unnerves him, it seems to affect him in a degree proportionate to the tenderness and care with which he has been habitually treated. Concerning his mode of life, when free to range at will, no particulars have reached us, but it is most probably similar to that of the squirrel tribe. Like them he harbours among thick clustering foliage, which affords a safe retreat; yet, judging of his natural habits from such as are observable in a captive state, we should pronounce that the elegant Merikana has no permanent abode, either for shelter or repose. Every animal that in a state of nature has any fixed dwelling, such as the squirrel and the beaver, the rabbit and the economic mouse, is endowed with the instinct of keeping it extremely clean; but such was not the case with the one of which we speak while in the French menagerie, though in his person fastidiously neat, and distressed at having his cage neglected.

Nor less engaging is the Squirrel Monkey (*S. sciurea*) of the Orinoco. This animal is of a

golden hue, and exhales a slight scent of musk. His physiognomy may be called infantine, with the same expression of innocence, the same unruffled smile, the same rapid transition from joy to sadness. When his fears are excited, his eyes suddenly become suffused with tears, and he seems to appeal only to the softer feelings of his master for kindness and protection. Apparently a stranger to irritation, his movements are light and airy, rapid and graceful. He delights to watch the lips of a person while speaking, and if allowed to sit upon his shoulder, will often endeavour to pat his teeth or tongue. Like many of the smaller American monkeys, he is remarkably fond of insects, and if the weather be cold, or damp, whether in cage or forest, the brotherhood crowd together, and often courteously salute each other by an interchange of paws and tails.

You may see the Squirrel Monkey at the dawn of day peeping from out his leafy citadel, on the banks of the Orinoco, his clear brown golden-tinted fur, fresh with the dew of night, and his bright glancing eye just opened on the wide expanse of waters. Now he brushes his head and coat with his fore-paws, and if he discovers you, the expression of his countenance undergoes a rapid change; at first he looks shy and curious, as if he would not dislike a nearer acquaintance; but if you make the slightest movement, or even a leaf rustles from the tree suddenly, he seems afraid, and, darting through the yielding branches, in a moment he is gone.

The Douroucoulis (*S. trivergata*), of Humboldt, is the most remarkable and insulated of the quadrumanous race. He remains listless and inactive

through the day, and hunts for birds and insects in the night, hissing like a cat, or making the forests resound with the cry of "muh, muh!"

The Capuchin (*S. capucinus*) of the Orinoco is brought to light by the same indefatigable naturalist. He is described as resembling man more nearly than any other of the transatlantic monkeys. Robust and active, fierce and untameable, his eyes have an expression of melancholy blended with ferocity, while his chin is hidden with a long and bushy beard. In order to avoid the danger of wetting this venerable appendage, he never puts his lips to the water, or to the vessel that contains it, but fills the hollow of his hand, and then conveys it to his mouth, at the same time that he inclines his head upon his shoulder. Hence the appellation which has been given him of Cheiropotes, or Hand-drinker.

This formidable creature has been seen on the banks of the Orinoco, beneath those lofty fan-palms that once supported the warlike nation of the Guaraunes,

Who dwelt "aloft on life-sufficing trees,

At once their dome, their robe, their food, and arms."

Time was, when he who sailed by night on the Orinoco saw with astonishment a long line of mysterious lights, seemingly suspended in the air. These were fires kindled for domestic purposes in the dwellings of the Guaraunes, and kept blazing through the night, to keep off musquitoes. The dwellings were made of mats, ingeniously woven with stalks and leaves, and suspended from tree to tree; they were partly covered over with clay, and

rendered commodious habitations. When the Orinoco overflowed its banks during the rainy season, the whole population betook themselves to their aerial habitations, and had no occasion to use their canoes for obtaining food; for not only does the fan-palm afford materials for making mats, and firm pillars on which to hang them, but before the blossoms of the tree expand, the pith of the stem contains a sago-like kind of meal, which is dried in thin cakes like cassava. The sap, when fermented, yields a sweet wine, and the fruit, which resembles a pine-cone, affords like the pisang, and many other tropical productions, a varied nourishment in its different stages. But the nations who once inhabited those trees, beside the ceaseless roar of the branching Orinoco, are now far away in the lone wilderness.

So, too, has the ancient population of the North American continent receded before the influx of colonization from the East.

I heard the forests as they cried
Unto the valleys green,
Where is that red-browed hunter-race,
Who loved our leafy screen?
They humbled 'mid these dewy glades,
The red-deer's antlered crown,
Or soaring at his highest noon,
Struck the strong eagle down.

Then in the zephyr's voice, replied
Those vales so meekly blest,
They reared their dwellings on our side,
Their corn upon our breast.

EXPULSION OF THE GUARAUNES.

A blight came down, a blast swept by,
 The cone-roofed cabins fell ;
 And where that exiled people fled,
 It is not ours to tell.

Niagara, of the mountains gray,
 Demanded from his throne,
 And old Ontario's billowy lake
 Prolonged the thunder-tone :
 Those chieftains at our side who stood
 Upon our christening day,
 Who gave the glorious names we bear,
 Our sponsors,—where are they !

And then the fair Ohio charged
 Her many sisters dear,
 Show me, once more, those stately forms,
 Within my mirror clear.
 But they replied, Tall barks of pride
 Do cleave our waters blue,
 And strange keels ride our farthest tide,
 But where's their light canoe.

Towns and villages now rise where the red men trod, and busy multitudes are seen engaged in the active duties of social life. Others are solely employed in rearing cattle, and hence it happens that in some of the wildest parts, rude huts attract the notice of the traveller, who sees in them the kind of habitations which sheltered our Saxon ancestors ; they are constructed of stakes and reeds woven together, and covered with hides. Those men who sought their homes on the wild and uncultivated prairies, selected contiguous farms, and their log huts often rose beneath the shelter of the sugar-maples, that formed a skirt of deep and beautiful forest on the banks of the river. "I well remember the day," wrote one of

the first settlers, "when our tents were pitched in the wild. Here all was fresh nature, as in our forsaken homes all had been marked with the labours of men. The sky was blue and cloudless, and the mild south wind gently rustled the trees, as it came loaded with fragrance along the flowering wilderness. The huge straight trees were covered with moss, and their gray trunks rose proudly like columns. Starting hares and deer, and the wild denizens of the woods, bounded away from our path; and eagles and soaring vultures sailed above our heads. Birds of brilliant plumage flitted among the branches, and countless millions of water-dwellers, awakened from the long sleep of winter, mingled their cries in the surrounding streams. We added to this promiscuous hymn of nature, the clarion echoes of our bugles, the baying of our dogs, and all the glad domestic sounds of birds and animals that have joined partnership with man; then came at intervals the heavy blows of the woodcutter's axe, the crash of falling trees, and the wild wood-notes of the first songs of man which these deep solitudes have perhaps heard from the creation."

He who traverses the vast forests of South America, where man has not yet fixed his abode, has frequently occasion to observe the marked characteristics of the Monkey tribes. At one time he sees the Cacajao (*S. melanocephala*), an inactive and timid creature, hastening to hide himself in the closest covert of the forest, when annoyed by the petulance of other monkeys, which seem to delight in disturbing the natural quiet of his temper, while he expresses his displeasure by a kind of convulsive

laugh. At another the Widow Monkey (*S. lugens*), apparently a timid and innocent creature, is seen resting on some near branch. There she will remain for hours motionless, as if absorbed in the



THE CACAIAO (*Simia melanocephala*).

memory of her griefs; but though remarkable for a look of pensiveness and timidity, she is mindful of her own advantage. She will not, perhaps, venture to attack you, because she well knows how to appreciate her own powers, but she is watching for prey. The moment she perceives an opportunity, she will dart like a tigress upon some small bird, or unsuspecting animal, and devour it without remorse.

The gentle, melancholy, and timid Marimonda (*S. beelzebuth* of Humboldt,) will often bite the hand of those he loves, when under the influence of fear. He rarely seeks the shelter of the forest, though inhabiting the wildest portion of the Andes, but will lie exposed to a vertical sun, with his arms folded on his back, and his eye directed upwards, as if he delighted to contemplate the majestic orb of day.

Let us now speak of that luxuriant vegetation, that eternal Spring, those climates varying by stages, as we ascend the vast Cordilleras, the native regions of innumerable wild animals, as well as the Marimonda, and black Howling Monkeys, which make the woods resound with their lugubrious voices. Stout of heart must that traveller be, who can hear unmoved the loud cries which they delight to utter, echoed from rock to rock, and often from out the depth of untrodden forests; cries so loud and shrill, that they drown the rushing sound of the torrents, which descend in beautiful cascades, or run through holes in the rocks, that look like stupendous bridges. Unacquainted with the tones of these strange creatures when excited by fear or curiosity, or even by the pleasure of howling in concert, he would conclude that troops of men were hastening from a distance with loud shouts to rush upon him.

Nature assumes in those solitudes the grandest, and most imposing forms. The rocky pathway is often bordered with a kind of bamboo, called by the

Indians *taqua* or *quada*, more than forty feet in height. Nothing can equal the elegance of this arborescent cane. The shape and disposition of the leaves are strikingly contrasted with the smooth and flexible trunk which bends towards the brink of rivulets, as if delighting in their freshness. Giant ferns also spring from out the fissures of the rocks, their leaves resemble fans, and the rich brown that enwraps the stem, forms another pleasing contrast to the vivid tints of their dark green leaves, decorated on the under surface with richly-coloured seeds in dots or rows. "If," says Humboldt, when traversing the magnificent solitude of the Andes, "I may be allowed to speak of my own feelings, I should say, that the bamboo and fern are, of all vegetable forms between the tropics, those which most powerfully affect the imagination of the traveller." The former grows especially on the eastern chain of the Andes. While some abound in watery places, and are cut down either for fuel, or to cover temporary huts; others spring profusely from out the fissures of high rocks in such arid spots as are rarely watered by streams. From the time of their first appearance until they attain perfection, when they are either gathered by the Indians, or naturally begin to dry, they uniformly contain a quantity of liquid, but with this remarkable difference, that when the moon is full, they are filled with sweet clear water. When, on the contrary, the moon begins to wane, the water ebbs; till, at the conjunction, little or none is to be found. Ulloa, who crossed the deserts of Chimborazo in his way to Quito, mentions this extraordinary fact. He states that the water during

the period of the moon's decrease, appears turbid,⁷ but that at the time of the full moon, it is as clear as crystal. Yet water is not found in the spaces between each joint alike, but alternately. Thus, if a space in the cane is opened which proves empty, the two contiguous ones are uniformly full. Nor are the contents of each portion of the cane from joint to joint, a meagre draught, for the canes are as remarkable for their length and thickness, as for the liquid contained in their tubes. Their diameter is at least six inches, and when opened, they form a board of nearly a foot and a half in breadth; hence, considerable houses are frequently erected with this light and elegant material. The water, too, which they contain, is an excellent preservative against the ill effects of bruises. Those who traverse the rough and dangerous tracts of the Andes, are often equally exposed to accident and thirst. These vegetable fountains, which rise in arid and dangerous parts, answer a double purpose: they refresh the weary traveller, and remove the dangerous effects that might otherwise result from frequent falls.

Their construction, too, is well deserving of consideration. They illustrate the striking fact, that a hollow cylinder is uniformly given to such plants as carry a considerable weight at the end of a long and flexible stem; or of which the material is peculiarly fragile. Bamboos spring out of the ground like grasses, they wave in the slightest breeze, and often grow on high places, swept over by fierce winds; they consequently require an organization very different from that of forest-trees, and hence in order to prevent them from being uprooted by the gale,

their stems are hollow, and the material of which they are composed, is so condensed on the surface as to possess nearly the hardness of metal. Silix is one of their component parts, and if two pieces of bamboo are rubbed together, they emit a pale light. Sir Humphry Davy first observed this phenomenon while watching a young child who was playing with some bonnet cane. He sought out the cause, and on examining the epidermis, it was found to contain the properties of silix. The epidermis of reeds and corn, and grasses, is similarly endowed. The corn and grasses contain potash, sufficient to form glass with their flint, and if a wheat or barley straw, or even a stalk of hay, be subjected to the action of the blow-pipe, a perfect globule of hard glass may be obtained.

Thus while a simple grass is secreting a volatile and evanescent perfume, it also secretes a substance which is an ingredient in the primeval mountains of the globe.

Beautiful fern,

Thy place is not where art exults to raise the tended flower,
By terraced walk, or decked parterre, or fenced and sheltered bower,
Nor where the straightly levelled walls of tangled boughs
between,
The sunbeam lights the velvet sward, and streams through
alleys green.

Thy dwelling is the desert heath, the wood, the haunted dell,
And where the wild deer stoops to drink beside the mossy
well ;
And by the lake with trembling stars bestud when earth is
still,
And midnight's melancholy pomp is on the distant hill.

But fairer than the lightest bud on spring's fresh couch
 which lies,
 And fairer than the gentlest flower which glows 'neath
 summer skies ;
 Or autumn's soft and mellowed tints upon the fading tree,
 Companion of the left, and worn, thy leaf appears to me.

For I have loved where thou wast reared in greenest
 strength to stray,
 And mark thy feathery stem upraised o'er lichen'd ruin
 gray,
 Or in the fairy moonlight bent, to meet the silvering hue,
 Or glistening yet, when noon was high, with morn's un-
 vanished dew. HOLLINGS.

The ferns which Humboldt so much admired are not peculiar to America. They are found in almost every part of the known world, and are included in those sixteen forms which chiefly characterize the vegetable physiognomy of the globe. But in no other part are they equally magnificent, and though often rising to the height of thirty or forty feet, they retain the delicate and complex leaflets, the slender stems, and rich brown tracery, which adorn the beloved ferns of our own green woods, and shady lanes. Assigned by their Creator to the tropical regions, they yet grow best in shady places, or where the ardent beams of the sun are tempered by refreshing breezes. They are often seen nestling in those stupendous chasms which seem as if riven by some great convulsion in the mountains ; or waving on their windy ridges ; and in the woody parts of South America are generally found in company with such trees as yield medicinal bark. Here, too, a similarity exists between the English and exotic fern.

Both grow to the greatest perfection in damp and shady places, or on open commons, and hence it is that the seeds are arranged on the under surface of the leaves, some in spots, others in long lines, others again like lace-work on the serrated edges. Storms may beat heavily upon them, and whirlwinds that send the fruit from off the trees, and even sweep from out their ancient fastnesses the firmest oaks, may rage around them, but the fern-leaf bends and trembles in the gale, rises when the storm has passed, and bends again beneath its fury, but not a single seed is scattered to the earth, before the season of its full development.

Beautiful, too, and useful in its mountain habitation is the vigahua, a single-leafed vegetable, about five feet in length, and two and a-half in breadth, which grows profusely in the sheltered valleys of the Andes. The under surface is smooth, and of a vivid green, divided down the middle with a thick rib; the upper is white, and covered with a fine and viscid down. Nothing can be more imposing than the effect produced by these elegant leaves, when seen beside the deep dark foliage of the fern. As the wind passes over them, first one and then another come into view; now the white appears, and now the green, and thus a graceful interchange of mingled tints is blended in striking contrast with the lichen-dotted rock, from which they spring.

Travellers have often recourse to the leaves of the vigahua, in order to construct a temporary shelter in desert places from the storms that are frequent in high latitudes.

Bending over the vigahua, the arborescent ferns,

and graceful bamboos, deep rooted in the rocks, and apparently coeval with the rocks themselves, rise bold groups of noble and majestic trees, lofty palms and cedars, varied with the *lana de ceibo*, a high and tufted tree, covered during summer with white blossoms, and in autumn with pods that open and throw out their cottony contents, which often hang in elegant festoons from branch to branch. This cotton is softer and more delicate than even that of Coromandel, and, should a method be discovered of manufacturing it for articles of dress, it might rather be called silk than cotton. For mattresses it has undoubtedly no equal, both with regard to softness and elasticity.

Three zones of vegetables extend far up the majestic sides of the vast Cordilleras. The valleys, or *gunga*, as they are termed, signifying dry plains, produce plantains, quineos, quiney pepper, and cherimoyas, with different roots, esculents, and fruit-trees in great abundance. Higher up grow pears and peaches, nectarines and quaitambos, apricots and melons, orange, limes, and citrons, of the finest flavour. Another zone of plants succeeds, presenting a most beautiful appearance, and yielding Peruvian strawberries, that carpet the earth with their broad leaves and white saucer-shaped blossoms, varied with rich scarlet fruit. For here the seasons succeed not one the other as with us; but buds and blossoms appear in mingled beauty, while rising from this carpet of nature's making. Apple-trees of luxuriant growth are covered with fruits and blossoms throughout the year.

While this luxuriant vegetation adorns the lower

range of the Cordilleras de los Andes, as the Spaniards call them, the upper is covered with snow that never melts. Those who have ascended to the highest elevation, affirm that the sky is always serene and bright, but that the air is so highly rarefied as often to render respiration difficult, while far beneath thunders are heard to roll, and the clouds that hover on the sides of the mountains, hide the lower range, with its woods and valleys, its deep solitudes, and sunny hills.

The natural historian may be allowed to diverge from his accustomed path, when in pursuit of animals or plants, he visits countries renowned for tales of other times. He may surely dwell on the history of by-gone days, and, in speaking of the Andes, it is interesting to associate with them the names of Ulloa and his companions; those enterprising men, who were sent forth by Louis XV. to measure a degree of the meridian, and who, having passed the woody belt of the Cordilleras, erected a solitary hut on the narrow summit of Pichincha. That hut stood at an elevation of two hundred yards above the highest part of the desert, it was based on one of the loftiest crags of the mountains, and was soon covered with snow and ice. The ascent was extremely rugged, and only admitted of being climbed on foot, during four hours of continual fatigue.

Thus circumstanced, the astronomers generally kept within the hut; they were constrained to do so by the severity of the weather, the violence of the wind, and the dense fogs in which they

were frequently enveloped. When the fog cleared away, the clouds descended nearer to the surface of the earth, and often surrounded the mountain to a vast distance, which appeared like a rocky island in the midst of a boundless expanse of ocean. Fearful were the sounds which then came from below, occasioned by the tempests that raged over Quito and the neighbouring country. Lightnings were seen to issue from the clouds, and loud thunders rolled far beneath, blended with furious winds; but a delightful serenity reigned on the summit of the mountain, the winds were lulled, having descended into the plains, the sky was clear, and the enlivening rays of the sun moderated the severity of the cold. But widely different was the condition of Ulloa and his companions when the clouds again resumed their high station. It was then impossible to breathe freely; snow and hail fell continually, and the wind returned with so much violence, that it was difficult to overcome the dread of being blown down the precipice, or buried by the daily accumulation of ice and snow.

The wind was often so terrific, that the sight became dazzled. Large blocks of stone were hurled by its fury from the side of the rock on which the hut was built; crashing as they fell, they broke the awful silence of the desert beneath; and frequently during the night, that rest which the adventurers so greatly wanted was disturbed by these sudden sounds. When the weather again was fair, and the clouds gathered around some other mountain, the astronomers left their hut, in order to take exercise. They then amused themselves with rolling large

masses of rock down the precipice, and this often required the united strength of the whole party, though continually effected by the mere force of the wind. But they took care not to venture too far from their hut, lest the clouds should suddenly gather round them, and preclude the possibility of returning. The door of the hut, meanwhile, was fastened with leather thongs, and not the smallest crevice was left unstopped: it was also compactly thatched with straw, yet still the wind penetrated through.

The days were seldom more cheerful than the nights, and all the light that could be obtained was that of two lamps, which the astronomers kept burning that they might distinguish one another, and employ their minds by reading. Though the hut was small, and crowded with inhabitants, the cold was such that each was obliged to have a chafing-dish of coals beside him. These precautions would have rendered the rigour of the climate supportable, had not the imminent danger of perishing by being blown down the precipice roused them every time it snowed, to encounter the severity of the outward air, and to sally out with shovels to free the roof of their hut from the accumulated weight. The party were not indeed without servants and Indians, but these were so benumbed with the cold, that it was difficult to induce them to move out of a small tent, where they kept a continual fire. All that could be obtained from them was to take their turn; even this was done unwillingly and consequently with little spirit.

Twenty-three tedious days were thus passed on

the rock. During this time, little, comparatively, was done, for when it was fair, and the weather clear, the other mountains, on whose summits the signals were erected that formed triangles for measuring the degree of the meridian, were hid in clouds. When, on the contrary, it was reasonable to suppose that they were clear, Pinchincha was hidden from the sight. It was, therefore, necessary to descend lower, and to erect signals in more favourable situations. This, however, did not lessen either the cold or the fatigue to which the party was subjected, for though they descended from the summit of the rock, the places where they made their observations, were still on the highest parts of the vast desert.

In all their stations, subsequent to that on Pinchincha, each company lodged in a field tent, which, though small, was less inconvenient than being crowded in one hut. Yet still the necessity for even greater exertion continued, the party being oftener obliged to clear away the snow; the weight of which would otherwise have demolished the covering. At first, they pitched these tents in the most sheltered places, but having resolved to use them as signals, they removed them to a more exposed situation, where the impetuosity of the wind was such as to tear up the piquets, and blow them down. Happily they had brought with them supernumerary tents, which, on more than one occasion, saved them from perishing. This occurred especially in the desert of Asuay. Three tents belonging to the company were pitched one after the other, and successively overturned by the fury of the wind. In this terrible

condition their only resource was to take shelter in a breach or chasm. The two companies were both at that time on the desert, so that the sufferings of both were equal. The Indians who attended them, frequently deserted; and thus were they as often obliged to perform everything themselves, till relieved by others, who were sent from a distance.

While thus labouring under a variety of difficulties from wind and snow, from frost and cold, forsaken by the Indians, with little or no provisions, and a scarcity of fuel, fervent prayers were offered for their preservation in Channan, at the foot of the Cordilleras, for the inhabitants feared that they must inevitably perish; and when, at length, the whole company passed safely through the town, the people ran out of their houses, with expressions of the most cordial delight.

It was at first determined to erect signals of wood, in the form of pyramids, but this intention was soon abandoned. Signals, indeed, of any kind, were either blown down by the wind, or carried away by the Indians who tended their cattle on the sides of the mountain. It was, therefore, determined to make the tents in which they lodged serve as signals.

Thus resolved, the astronomers, on descending from the summit of Pinchincha, entered upon that stern, and dangerous life, which continued for nearly two years. During that time, they successively occupied sixty-five stations in the most desert places. In each, the inconveniences were the same, but they became less harassing in proportion as their bodies were inured to fatigue, and naturalized to the cold

of those high regions: so that, at length, they were reconciled to continual solitude and hard living. Even the diversity of temperature did not affect them, when they descended from the frost-bound regions, into plains and valleys, where the heat though moderate, often seems intense to those unaccustomed to the change. Lastly, they encountered without fear the dangers that are unavoidable among precipices, and in untrodden deserts. The little cabins of the Indians, and the stalls for cattle, scattered on the skirts of the mountains, and where they used to lodge in their passage from one desert to another, were to them as spacious palaces; mean villages seemed like splendid cities, and the conversation of a priest and two or three of his companions, charmed them like the banquets of Xenophon; the little markets too, held in the towns through which they happened to pass, seemed to them as if filled with all the variety of Seville fair. Thus the least object became magnified, when they descended from their places of exile, which often continued for fifty days; and it must be owned, that at times the sufferings of these enterprising men were such, that nothing could have supported and encouraged them to persevere, but the high sense of honour and integrity which equally induced both companies not to leave imperfect a work so long desired by all Europe, and especially by the sovereigns who then filled the Spanish throne.

No less than thirty-five signals were erected by Ulloa and Condamine; thirty-two by Godin and Juan. Some of these were in deserts, far above those belts of vegetation, which diversify the sides

of the mountains; in places too, where they had to contend with furious winds, and extreme cold. One of these stations may be briefly noticed in connexion with the history of animals, because every living creature instinctively avoids it, nor could the mules, those hardy animals, which carry heavy burdens in the most rigorous mountain passes, be kept together by the Indians; so that they were obliged to go with them in quest of a milder air. This was the desert of Pucaquaico, beside the mountain Cotopaxi. There the fury of the winds, and the whirlwinds of snow and hail were so tremendous, that, to use the language of Ulloa, they seemed endeavouring to tear up that dreadful volcano by the roots. Often too, and that in the midst of ice and snow, did their tents rock from side to side, from the effect of earthquakes, which reached for leagues around.

Return we now to speak of a class of animals which are pleasingly associated with ancient ruins, and the wildest solitude. This is the tribe of bats. Several distinct species are peculiar to the new world, and among these we recognise as some of the most conspicuous, the Javalin and Spectre bats (*phyllostoma hastatum*: *p. spectrum*). They are accused of destroying men and cattle, by sucking their blood; but the truth, says Cuvier, appears to be, that they only inflict small wounds, which occasionally become inflamed from the heat of the climate. Don Felix d'Azzara relates, that he was often bitten by them, while sleeping in the woods; the injury was, however, trifling, and occasioned

only a slight inconvenience. Wrapped in dusky coloured mantles, and flying solitarily, and at night, their appearance is gloomy; even their faces seem full of thought, and seem to express aversion to society; hence some imagine that they must necessarily be ferocious. But such is not the case: they are generally quiet and contented creatures, flitting about by moonlight, and living on small insects. When these are plentiful, they seek for no other food, and they will never attack large animals, unless urged by extreme necessity.

Waterton has preserved several interesting memoranda of their relatives, the Vampire bats, which infest the wilds and forests of Demerara. These creatures nestle in hollow trees, or clear out the inside of large ant-nests, and then take possession of them. When evening draws on, they leave their hiding places, to soar along the river banks in quest of prey; and he who sleeps soundly in his hammock, often finds on waking, that his foot is stained with blood. And not man alone, when insect food is scarce, but every unprotected animal is exposed in turn, to their depredations. Nay, so gently do they supply their wants, that instead of being roused, the patient is lulled into a still profounder sleep. Yet Vampires do not always live on blood; when the moon shines bright, and the fruit of the Banana tree is ripe, you may see them approach and eat. Waterton noticed this fact during his abode in Mr. Edmonstone's deserted habitation at Meriba creek on the Demerara river; the house had been dismantled for some years, the roof had fallen in, and the room, where governors

and generals had met, was now deserted and tenanted by the Vampire. Here, then, was a fine opportunity to watch the movements of this strange creature. He was often seen to help himself from the Banana-tree, and would also bring into the loft a green round fruit from the forest, something like a wild guava, and about the size of a nutmeg. There was something, also, in the blossom of the suwarri-tree, which was grateful to him, for, on coming up Waratilli creek, in a clear moonlight night, Waterton saw some Vampires fluttering round the top of the sawarri-tree, and every now and then the blossoms, which they had broken off, fell into the water. They certainly did not fall naturally, for, on examining several, they appeared fresh and blooming. It was, therefore, evident that the Vampires pulled them from the tree, either to get at the fruit, or to catch the insects which often nestle in flowers.

These strange quadrupeds frequent deserted houses, as well as hollow trees, and ants' nests. Sometimes a cluster of them may be seen hanging with their heads downward from the branch of a tree.

In matted woods, where birds forget to sing,
And silent bats in drowsy clusters cling.

It was highly amusing to watch their movements, as they flitted to and fro along the banks of the Essequibo; to sit, as Waterton beautifully describes, on the branch of a fallen tree, near the water's edge, to listen to the soft and plaintive cries of the goat-suckers, repeating their evening songs, or to observe the owls and vampires, as they every now and then passed up the river.

Two peculiarities are discoverable in these nocturnal creatures, which may well detain us a few minutes to observe. Curious is it to remark by what a variety of means the same effect is frequently obtained. The eyes of such carnivorous animals as hunt their prey by night, are admirably adapted for seeing in the dark; they possess a faculty not given to those of other species; they can close the pupil entirely. This faculty depends upon the superior sensibility of the retina, upon its being easily affected, because it is needful for them to descry objects with the smallest degree of light. But no such faculty is obvious in the bat, they owe apparently, the facility with which they pass unhurt, even in the darkest nights, through small apertures, and among thick boughs, to the enlargement of another sense. Spallanzani caught several bats, and having covered their eyes, turned them into a dark room, which opened into a narrow way, from which even the faintest ray of light had been carefully excluded. They flew without striking against the walls, and would often suspend their flight when they came to a place where they could conveniently perch: in the passage, which turned at right angles, they would, though at a considerable distance from the walls, change the direction of their flight with the greatest nicety, when they drew near the angles. They also carefully avoided striking against the branches of trees, which Spallanzani had suspended from the roof, and even flew between strong threads, which hung perpendicularly in like manner; though frequently obliged to contract their wings in order to pass between them. It was naturally inferred

that these creatures owed the facility of flying through intricate places in the dark to the sense of hearing, rather than of sight. Their ears were, therefore, tied up, and then the poor bats could no longer find their way. They became sorrowful, and refused every kind of food, remaining quiet through the day, and if set at liberty for a few minutes, with their eyes uncovered, they merely crawled into some dark corner or crevice. But at sunset, the scene was changed: each one then endeavoured with loud chirpings, to scratch his way through the box; and when taken out, such as had their ears and eyes covered, knew not where to fly, or what to do, while those who were merely blinded flew about, or ran to a convenient place for taking wing. Anatomists relate that the faculty thus given of flying safely in the dark, even when blindfolded, is occasioned by the incredible number of nerves that expand on the upper jaws, the muzzle, and the organs of hearing.

The hook, too, which is observed at the angle of the wing in this interesting quadruped, how curious it is! Formed exactly like a claw, it enables the creature safely to attach herself to crevices or joinings in stones or timber. Without this aid, she could not rise from off the ground, for her legs and feet are not adapted to the purpose, but with it she readily runs up a wall, or tree, and then takes flight.

This animal affords, therefore, a striking instance of design in its formation, and of adaptation to surrounding objects and circumstances; the tree or the rock to which she clings, and the darkness through which she wings her dusky flight. Here, as in all the

works of the Creator, we discover the most perfect order, and the most wonderful combination of means to produce a desired end. If, when darkness has passed, and the bat has retired to her shelter for the day, we observe the flights and motions of the creatures which then come forth from the coverts where they have slept securely through the night, the beauty of the vegetable world, and the place to which every shrub and flower is assigned; what symmetry and beauty is discoverable, what a wonderful adaptation of plants, and animals, and birds, to the sites which they are designed to occupy!

Take, for instance, the recently discovered *Victoria Regina*, that noble flower which M. Schomburgk saw growing on the river Berbice, and which appears in the distance like a magnificent salver, ornamented with a light green rim, and reflecting a vivid crimson glow from the under surface as it floats on the bosom of the river. From out the centre of this arises a splendid flower with a hundred petals, sweetly scented, and, at one period of its growth, of the purest white. As the narrator rowed from one plant to the other, he was continually delighted with observing some new beauty; several which had just expanded were quite white, others rose-coloured, others pink. The rim especially attracted his notice; it was at least five inches high, and was obviously designed to prevent the water from overflowing the surface of the leaf, when agitated by a brisk wind. Nor was it without a considerable degree of beauty, the inside being of a light green, the outer of a brilliant crimson. Uniting also an equal degree of elegance and utility, up rose

the central stem and its ponderous calyx, each of whose ample leaves, at least seven inches in length and three in breadth, were thick and white within, and reddish brown and prickly on the outside. These hold up and closely embrace the flower, and keep it safe from the splashing of the water, before it is sufficiently expanded to throw off superfluous moisture, and to present its splendid disk to the action of the sunbeams. We may conjecture that this plant, like the *Vallisneria* on the Rhone, is enabled to maintain its station on the surface of the river by means of an elastic spiral stalk, which contracts or extends as the river falls or rises.

But we need not seek in distant regions for instances of wisdom and beneficence among the vegetable tribes; they occur in every meadow and in every hedgerow. Observe, for instance, the white archangel, which grows among long grass, and the papilionaceous tribes on places open to the wind. The petals of the one are arched to protect the open seeds, the blossoms of the other are so constructed as to turn their backs against the wind, in the same manner as a weather-cock. Happy are those, said the poet Gray, who can raise a rose-bush, or cultivate an honeysuckle, who can watch with pleasure a brood of chickens, or young ducklings as they sail upon the water; in other words, happy are they who can derive enjoyment from the natural objects that surround them. This is a simple truth, yet an unchanging one, and I recommend it to the attention of my readers. I pretend not to say that a taste for natural history will make them happy, religion alone can do so; but it will render the unhappy

less desolate. The mind requires occupation, and if no pursuit is at hand it will prey upon itself. I have visited the abodes of squalid misery, both in garrets and in cellars, in places from which all earthly comfort seemed to be withdrawn, but never have I met with persons so wretched at heart as those who have no stimulus to exertion. The hope of getting employment is the polar star of such as are out of work, and whose misery springs from this cause; but the individuals of whom I speak have no polar star whatever; to them, therefore, the study of natural history would be a safety-valve, and whatever they brought to the light of science would increase in interest. The flower would appear more beautiful the more it was examined, and the tree, now thought of only as a thing to be cut down and applied to domestic purposes, would stand before them a majestic column, with its internal mechanism wonderfully adapted to answer the requirings of vegetable life; with its outward beauty, majestic even in the depth of winter.

The consideration of all natural objects is calculated to enlarge the mind, whether they are such as men call great, or whether they are such as the foot treads upon, and the eye will scarcely deign to glance at. Ignorance naturally accompanies indifference, and there are many whose feelings and capacities are narrowed within the circle of their daily wants, merely because they have no sympathy with the objects that surround them. But call forth that latent sympathy, and let them understand the extent and the variety of interesting objects that are within their reach, they will seem to acquire new

faculties, and to commence a new existence. Men of the greatest abilities call nothing insignificant which the Lord has made: to borrow the eloquent observation of a North American naturalist, they can watch from day to day to catch the glance of the small bird's wing, or listen to its song; the world and everything in it looks bright to them, when to others the bird is but a flying animal, and grass and flowers only the covering of the sod.

Proceed we now from the southern regions of the American continent, to consider the Black Bear, a formidable creature which inhabits the recesses of the forests that cover a considerable part of North America. There you may see him, stern, rugged, and untamed, ranging those vast regions in quest of his favourite viands, either fruits and vegetables or small animals, or approaching river banks to search for fish. When the streams are frozen up, and snow lies thick upon the ground, he intrudes on the neighbourhood of cultivated and peopled regions, where he occasionally attacks large animals, and even man himself. His movements on the ground are extremely awkward, but he climbs and swims with ease. In his excursions he usually follows the same path, which becomes at length so well beaten that Indian hunters trace him through the mazes of the forest, and thus unkennel him in his closest coverts.

When the winter sets in with all its attendant horrors, such bears as dwell far north in America, immediately abandon their accustomed haunts, and hasten to a less rigorous climate, where they remain till the

breaking up of the hard frost. They select a temporary shelter, either in the trunk of some hollow tree, or beneath an overhanging rock; this they furnish with dry leaves, and soon sink into a lethargic slumber, from which nothing awakes them till the return of spring. It seems as if their movements were controlled by some unerring guide—as if the bounds of their habitations were so determined that they could not pass the allotted barriers; they never descend further south than the latitude of the Floridas, nor westward than the Pacific Ocean. Yet still the boundary is an ample one; it embraces an extent of country which combines the sternness of winter and the beauty of perpetual spring. Throughout this extensive portion, black bears may therefore be said to be indigenous, though, like the native tribes, once lords of the new world, they disappear from the newly-peopled districts. But the growling brotherhood do not retreat when the first blows of the settler's axe fall heavy on the trunks of the noble trees; they linger in the recesses of the remaining forests, of such especially as yield the mast on which they principally feed; nor is it till the last group has fallen, that they finally disappear. Even then, if there be mountains in the distance, or a range of broken rocks covered with underwood, they repair thither as occasional visitors, and the settler, who pleases himself with thinking that the ancient tenants of the soil have fled away to the lone wilderness, may chance to see a company of them in some bright moonlight night feeding among his wheat or maize. Happy would it be for him, if, when the meal was finished, they quietly with-

draw; but this is not their way, they often gambol and frolic about in their own peculiar manner, and trample under foot far more than they consume. Deeply vexed at seeing his field thus injured, the farmer can only look on and complain of the invasion; for, unless he can summon to his aid stout men and faithful dogs, he may not venture to intrude upon the dancers.

It also happens, and not unfrequently, that when a wide extent of country has been effectually cleared, when scarcely a tree remains to tell of the vast forests that once shadowed the land, and when the numerous population of wild animals, bears and foxes, racoons and monkeys, with their various tribes and families, have hastened far from the log-built cabins into the depths of untrodden forests, that suddenly a company of bears have reappeared; and haunted for some time every valley and mountain-ridge, making it dangerous to pass, and sallying forth at night into the vicinity of farm-houses, where, however, their depredations are almost exclusively confined to the pig-sty, or rather to the hog-yard.

According to Clarke and Lewis, many powerful and ferocious species of the bear are found in the Arctic regions of America. But most probably these are varieties distinguished by different shades of colour. The Indians speak of them as equally strong and rapacious, and such is their dread of these fierce creatures, that they never venture to attack an individual, except in parties of six and eight, and even then they are frequently defeated with the loss of one or more of their numbers.

Armed solely with bows and arrows, or with guns that cannot be depended on, they are obliged to approach the animal, and as no wound except through the head or heart is mortal, they often fall victims, if they miss their aim. Indeed, the Transatlantic Bear will rather attack than avoid a man. Such is the terror he inspires, that the Indians who go in quest of him paint themselves, and perform various superstitious rites, before proceeding to the fray.



THE BLACK BEAR.

These people destroy considerable numbers by setting fire to their favourite haunts; the forests are their home, and throughout the extent of Canada and Louisiana, they prefer residing in hollow trees. Those who have merely seen this formidable crea-

ture when led along to exhibit his awkward grimaces for the amusement of a village crowd, would think it impossible that such a clumsy animal could ascend high trees. But such is the fact. His habitation is at least thirty or forty feet from the ground, and as soon as the wreathing smoke around the root of the tall tree announces that the conflagration is begun, the poor mother descends the tree first, and is slain before she reaches the ground; the cubs, who anxiously follow her steps, are seized by throwing a rope round their necks, and carried off to be killed for the table, or to be trained as dancers.

In speaking of such animals as are able to endure the extremity of winter, it is worthy of remark that they travel from one continent to another, either upon pieces of floating ice during the summer months, or when the Arctic seas are frozen over; while those who inhabit the southern parts of America are widely different from the inhabitants of the ancient continents, under the same degrees of latitude. Hence the Bear and Wolf, the Reindeer and the Stag, the Beaver and the Fox, are equally known to the inhabitants of Canada, and to those of Russia, while the Agouti and the Llama, the Armadillo, the Tapir, and the Pecary, with various others of different localities and habits, are confined to the new world.

The Yellow Bear of Carolina, and the Grizzly Bear, are sufficiently identified. The last, an exceeding fierce and cruel creature, nine feet in length, was killed by Lewis and Clarke, during their celebrated expedition across the continent. The Mis-

souri Indians often go to war in small detachments against this animal, and trophies made from the skin are not only highly esteemed, but dignify the individual who obtains them. Dr. James saw on the necks of several warriors, ornaments constructed of the long fore-paws separated from the foot, and tastefully arranged in a radiating manner. One of the band of Pawnee warriors who encountered a detachment of his party, near the Kanza, was adorned in like manner with the skin of the forefeet, while the claws remained upon it, and hung suspended on his neck. Yet the Grizzly Bear is not exclusively carnivorous; he often feeds on vegetables, and digs up a variety of roots.

That the species once inhabited the Atlantic states, and were then much dreaded by the Indians, seems evident from a tradition of the Delawares respecting the big naked Bear. They believe that the last of this tremendous race formerly existed east of Hudson's river, amid deep pine forests, and wild rocks, covered with eternal snow. And even now, this formidable creature is often presented by the Indians before the minds of their crying children to frighten them to silence:

Governor Clinton assures us, that an Indian trader told a friend of his that the Grizzly Bear had been seen fourteen feet in length; and yet that, notwithstanding his ferocity, he has been sometimes domesticated, an Indian belonging to a tribe on the head waters of the Mississippi having one in a reclaimed state. This bear was the innocent cause of a serious affray between two neighbouring tribes. His master sportively directed him to take a seat in

a canoe belonging to another tribe, when returning from a visit. The bear, very properly obeyed; but the Indian, into whose canoe he entered, not liking the intrusion, or fearing, perhaps that he might fancy a young child for dinner, gave him an uncivil reception with his cane. This was considered an affront; for the bear was looked upon as one of his master's family, the insult was accordingly resented, and hostilities commenced between the tribes.

A half-grown specimen was kept chained in the yard of the Missouri Fur Company, near Engineer Cantonment. He was fed, during the winter, principally on vegetable food, as it was observed that he became extremely fierce when too plentifully supplied with animal fare. Confinement seemed irksome to him; no doubt his thoughts often wandered to the wild rocks and precipices where he first saw the light. His attendants sometimes ventured to play with him, though always with great caution, as they feared to get within his grasp. Yet he occasionally broke loose, and when this occurred he manifested the greatest joy, either by running about the yard, or rearing on his hind legs, and capering in all directions. Dr. James was present at one of these exhibitions. The Squaws and children, belonging to the establishment, ran precipitately to their huts, and closed the doors with dread. Even the dogs avoided him in his boisterous rounds; and finding no other playmates, he ran to Dr. James, began rearing on his hind legs, and placed his huge paws upon his chest. All this was done in sport, but Dr. James, wishing to rid himself of such rude gambols, turned him round,

upon which he went frolicking down to the river bank, and plunged into the water, where he swam about for a considerable time. A man of Dr James's party had several narrow escapes from the Grizzly Bear, when hunting with a companion on the upper tributaries of the Missouri. While thus engaged, he heard the report of his companion's rifle, and on looking round, beheld him, at a little distance, endeavouring to escape from one of these fierce creatures. The hunter, attentive only to the preservation of his friend, immediately hastened to divert the attention of the bear to himself, and arrived just in time to effect his generous object. He lodged his ball in the animal, but was obliged to fly in his turn; whilst his friend, relieved from immediate danger, prepared for another onset by charging his piece, with which he again wounded the Bear, and saved the hunter from pursuit. In this most hazardous encounter, neither of them was injured, and the bear was happily destroyed.

Several hunters engaged in the same dangerous occupation, were pursued by a Grizzly Bear that gained rapidly upon them. A boy belonging to the party, who could not run as swiftly as the others, seeing the Bear behind him, fell with his face to the ground. The Bear came up, but instead of offering him the least molestation, he reared on his hind feet over the terrified boy, looked down for a moment upon him, and then bounded onward in pursuit of the fugitives. The poor boy would have been but as a mouse in his huge paws; for such is the creature's strength, that when a marksman had shot a bison, and left it for a short time to obtain further aid, he found on his return that the body

was dragged away to a considerable distance by a bear, who had further scooped out a hollow in the earth, where he deposited his prey.

The northern forests in which these animals abound, are the favourite haunts of the Virginian Horned Owl, whose loud and full nocturnal cry is heard in unison with the howling of the wind, and when sounding from out the gloomy recesses of the forest, bears some resemblance to the human voice, uttered under feelings of extreme distress. A party of Scotch highlanders in the service of the Hudson's Bay Company still remember the painful effect which this strange sound produced on their minds. They had encamped after nightfall, during a winter journey, in a dense clump of trees, whose dark boughs and lofty stems, the growth of ages, gave a peculiar solemnity to the scene. Near them was a tomb, which stood cold and prominent near the flickering flame of their watch-fire, and which some Indians had erected in this solitary spot. Having finished their repast, and trimmed their fire for the night, they prepared for repose, when suddenly the slow and dismal notes of the horned owl fell on the ear with a startling nearness. Accustomed from infancy to believe the wild and romantic legends of their country, they at once concluded that the strange sepulchral voice must be the moaning of the spirit whose rest they superstitiously fancied they had disturbed; and though years have passed since that night, many of the company still shudder when they speak of the hours which they spent in that ill-omened spot*.

* *Fauna Borealis Americana.*

The vast forests of America, such especially as border the shores of the Atlantic, harbour in considerable numbers the playful and capricious race of Racoons (*Ursus loter*); while their less hardy brother, the Crab Raccoon (*Procyon cancrivorus*) prefers the milder climate of the south.

The former of this interesting species is peculiarly active in the night. During the day he seems asleep, curled up in his nest like a dormouse; but when evening draws on he is all alive. He then climbs the highest trees, in order to surprise the unconscious birds, and plunder their little citadels; or ferrets into the hollows made by woodpeckers in aged trunks and waving branches, strips off the moss and lichens to search for insects, and peeps into every fissure of the earth, that may chance to excite his curiosity. As he drinks by suction, and water seems essential to his comfort, he frequents the banks of rivers, and is often seen running along the sea coast, to catch molluscæ and crab-fish. His sense of smelling is exquisite, but not so his organs of hearing; and though easily tamed, or rather made familiar with the hand that feeds him, he seems incapable of either obedience or affection. If once a prisoner, he must always continue such; he cannot be trusted with partial freedom. Captivity causes him to contract new habits, but he never loses his love of liberty.

This animal has been frequently brought into Europe, and is well known with regard to character and organization. But little has been ascertained with certainty respecting his wild habits, the means by which he obtains his food, or in what way he

defends himself against his enemies. Captivity is unfavourable to the development of instinct. Close confinement and the monotony of an unvaried life frequently make the most vivacious appear dull of apprehension. Animals must be observed in their native haunts, before an accurate judgment can be formed respecting them; they must be seen also in their various relations to others, before we can decide whether they are gentle and affectionate, or ferocious and incapable of being tamed.

Like most of the wild commoners of nature, he has his bounds prescribed and tenaciously preserved. Mackenzie found him on the borders of the Red River, at forty-five or fifty degrees of north latitude, and he also descends far towards the south, ranging at will, from cold and frost-bound regions, to countries blessed with perpetual spring, and, again, ascending from those lofty mountains, which lie beneath the equinoctial line to the verge of perpetual winter, where a few gray lichens and stunted pines proclaim the utmost limits of vegetable life. It seems as if the racoon delighted to experience the vicissitudes of soil and climate, as if it was indifferent to him, whether he sojourned amid lawns and pastures, beside clear running streams, or sunny hills, and in sheltered vallies, or sought a precarious sustenance among dreary rocks; in wide inhospitable deserts, and gloomy woods, which the cheerful sunbeams can hardly penetrate.

Respecting the Brown Coati (*Nasua fusca. Cuv.*), which affects the warm regions of America, the natural historian has little to record, excepting that although his feet are demi-webbed, he can ascend

with facility the highest trees, and subsist much in the same way as our common martens; that farther, he lives in small communities, and occasionally commits serious depredations among the sugar-canes.

In speaking of the Red Coati (*N. rufa*) M. Cuvier regrets that his native language is inadequate to describe the multifarious colours which distinguish the animal creation. But the wonderful manifestations of wisdom and beneficence which are everywhere discoverable, exceed the scope of human language, and the limited faculties of men, accurately to comprehend or to pourtray. The prodigality of colours, the variety of tints, which are obvious even in a shell or flower, in a bird or insect, can never be adequately described; they are perceived by the eye, they gladden or elevate the mind, but who may convey an accurate idea of them to another? No one ever formed a correct picture of a beautiful animal from mere description. The same remark may be made on the varied hues of a magnificent sunset; and the changing lights, the radiance and the blendings of those playful tints which sport on the surface of the ocean.

The red coati has been known for a considerable time, but he has not till lately been described with accuracy. Smelling is the most remarkable of his senses; those of taste, of sight, and hearing, seem peculiarly obtuse. His nose is perpetually in motion, and he applies it as if trying to feel every object presented to his attention. He also uses it in digging, with the aid of his fore-paws, which

are extremely useful to him while climbing and descending trees. For the coati does not descend backwards like the cat or bear; he comes down with his head foremost, and clings in his perilous descent to the rough bark, or to small twigs and projections, which serve him as a ladder. This is effected by means of his hinder claws, which are so constructed as to enable him to turn them back, like hooks, to a great extent. His voice is a gentle hissing when in a good humour; a shrill and piercing cry when under the influence of fear or anger.

The individual which gave rise to these remarks was an inmate of the French Museum. Without being actually malicious, he was never completely domesticated, and though at times allowing himself to be caressed, he would more frequently bite the hand that was extended to play with him. On this account it was necessary to keep him shut up. Possibly he was irritated by the remembrance of his past condition. We know that animals are endowed with memory; they recognise those who were kind to them, even after the lapse of many years, and it is more than probable that they often recur when in a captive state to their native haunts. In the present instance, confinement seemed to depress the faculties of the red coati, yet in disposition he so much resembled his brown relative, that we may conjecture little difference to subsist between them, excepting that the former live retired in small parties, while, on the contrary, the brown coati love to associate in large communities.

We have reason to believe that the species of which we have just spoken is principally confined to the province of Rio de la Plata—to that woodless and mighty plain—that continued level, uninterrupted by the smallest hill for several hundred miles, yet beautifully varied with rich pasture grounds, and fields producing an abundance of trees yielding delicious fruits, with cotton and tobacco, indigo, pimento, and ipecacuanha, and the valuable herb called paraguay, which is annually exported to the value of one hundred thousand pounds, merely to the provinces of Chili and Peru. This plant is serviceable in disorders of the head and stomach, it preserves the miners when brought in contact with the noxious mineral streams that would otherwise suffocate them; it is also a sovereign remedy in many fevers, it allays the gnawings of hunger, and purifies the most unwholesome water.

Palms also grow there, the noblest productions of the vegetable kingdom in southern countries, but no where so abundant or so beautiful as in the finest parts of South America. It is curious to trace their progress from the equator to the temperate zone, to observe how gradually they diminish in size and beauty, and how fully they expand in countries where the usual degree of heat is from 75° to 80° or 83° of Fahrenheit. America is, therefore, the land of palms, for both in Asia and in Africa the species are comparatively rare, with the exception of the date, which is invaluable in the country where it grows, and which even thrives in the south of Europe.

The Jagua and the Piriguao are the most magnificent; the first especially, which seems to concen-

trate the varied beauties of the tribe. They rise in stately groups from the fissures of the granite rocks at the cataracts of Maypure and Atures, on the Orinoco; their slender and polished stems attain to the height of sixty or seventy feet, surmounted with a canopy of enormous leaves, and yet so light are they, and airy, that they rustle to every passing breeze, and present in their playful quiver a striking contrast to the deep dense mass of foliage far beneath, and of which scarcely a leaf is seen to stir. This valuable species bear enormous clusters of purple and gold-coloured berries, which yield abundance of farinaceous food, and are equally pleasant and nutritious. Others there are, whose tall, unbranched, and slender stems, crowned with elegant and feathery foliage, give an impression of vegetable youth, while beside them some gnarled and gigantic tree may seem to indicate that long centuries must have passed over its sapless trunk. But such may not be the case; many years are needful to perfect some trees which yet retain the vigour and the beauty of their first existence, while others speedily decay. Even the stately Oak, and the stupendous Baobabs, of Senegal, though they convey an idea of great strength, combined with age, may begin to fail in even a less period than the Palm.

In the Oak and Ash, in the Chestnut and the Beech, and generally among forest trees one character pervades the different species. The broad umbrageous foliage of the Oak, and its widely-extended arms, its giant port, and club-shaped leaves, are discoverable in no other species of forest tree. The Ash, on the contrary, owes its light and

graceful appearance to its compound leaves with their long and oval leaflets; the Horse-Chestnut, its dignified and pyramidal character to the arrangement of the boughs, which group around the parent stem, broad and spreading at the base, and gradually diminishing till they reach the top; the Beech, its noble bearing among forest trees to the smooth and beautiful trunk which throws out in all directions those massive and yet waving branches, which gently droop towards the earth, mantled in spring with leaves of the lightest green, and during autumn exhibiting the varied tints of yellow, brown and orange. In each of these an individuality of character exists; but such is not the case with the palm tribe. In the Piritu, the stem is slender, like a reed; in the Palma de Coveja, it is scaly: in one species prickly, in another irregularly thick. In the Palma Real, of Cuba, it is formed like a spindle, small at the base and top and swelling in the middle, and often rising to the height of 180 feet, crowned either with widely-spreading and feathery, or fan-shaped leaves. And as the leaves of European plants present different kinds of green, and each peculiar to separate species, so in this respect also a remarkable dissimilarity subsists. Palms are not more unlike in their appearance than in the colour of their leaves; some are white on the under surface, like those of the white-beam hawthorn, which often present a pleasing contrast to the deep foliage of our forest trees; others are dark green, and shining like those of the favourite holly, of our lanes and commons—

With polished leaves, and berries red.

Others, again, are fan-shaped, and adorned with

concentric blue and yellow rings, like those in a peacock's tail. The flowers too, though various in shape, are generally of a dazzling white, or pale yellow, but the fruit is in one species round, in another oval, in a third oblong, in a fourth egg-shaped and growing in brilliant gold and purple-coloured clusters.

The Poto or Kinkajou (*Pottos caudivolvulus*), resembles, in his physiognomy and natural disposition, the active and graceful Lemur. But his organs of mastication and of motion are widely different. His claws and canine teeth are like those of the carnivorous animals, but then his long prehensile tail bears no affinity to theirs. If some characteristic traits connect him with the bears and coati, his countenance and disposition are not the same. The proper station of his family seems to be immediately after the *Quadrumana*, between which and the carnivorous tribes, he might establish a new connecting link. Links, indeed, there are, which seem to bind the visible creation into one. They resemble the threads that compose the tissue of an immense and ingenious piece of net-work. Nor does there exist a more curious subject of research than these connecting links between various orders, genera, and species. We have reason to believe that a gradual and unbroken gradation of living creatures ascends from the rock-adhering zoophyte to the higher species of mammalia, and a sufficient number are everywhere perceptible to convince us that a kind of circular chain unites the numerous branches of the great family of earth to-

gether. But man is not included. Formed in the likeness of his Maker, and designed to be the temple of the Holy Spirit, he has dominion over all, and stands at an immeasurable height above every other species of organized existence.

The poto has been brought into Europe several times, and has been as frequently described. His disposition is said to be remarkably mild; he passes the day in sleep, lying on one side with his head reclining on his breast and covering himself with his arms. When aroused he generally complains of the interruption, and runs to shade his eyes from the full blaze of day in some obscure corner, but caresses soon bring him back; he begins to play, till the excitement is withdrawn, and then the love of sleep seems to overpower him. When evening draws on, he slowly awakes, rouses himself, steps forward a few paces with irresolute and measured steps, utters a bleating sound, and puts forth his long tongue. If milk be offered, he laps it like a dog, and partakes heartily of fruit or bread. Such are his habits when domesticated. In a wild state, he is said to climb the highest trees, and to descend by the aid of his hind legs after the manner of the coati. His tail is also very useful; it serves him instead of a hand in holding by the branches as he climbs from tree to tree, and he draws with it such objects towards him, as could not be otherwise obtained. The tongue of the poto is very long and slender: when he discovers, by the sense of smelling, that honey is within reach, either in a cavern or a hollow tree, he immediately repairs thither, and, cautiously ascending the trunk or rock, darts forth

his tongue into the nest, and sweeps away such of the humming population as are within reach. I have never seen the poto, and cannot, therefore, conjecture in what way he is defended from their stings. We know that bees when irritated rush forth from their citadels, and furiously attack the aggressor, and that it is difficult, if not impossible, so instantaneously to extinguish life as to render the sting innocuous. The tongue, therefore, must be either covered with an impenetrable skin, or else defended by some glutinous exudation—the throat also, and the stomach, must have some peculiar defence—for terrible instances are recorded of extreme suffering being occasioned, both to men and animals, by eating fruit in which a bee or wasp has been secreted. The body of the poto must be also well protected, or else assuredly he would never venture the second time to carry on such an unequal warfare. Perhaps his skin is thick, or the hair may be close and strong. The Honey-guide furnishes, among birds, a striking instance of evident design in giving an impenetrable coat of mail to a creature which has to seek its food among angry bees. The feathers, unlike those of the nightingale and goldfinch, the wren or robin, are short and hard, and lie close one upon the other; the skin is thick, and the fibres so pressed together, that it is difficult to penetrate them even with a pin. Thus guarded, the Honey-guide goes forth to seek his favourite food in hollow trees; the busy people, roused in the midst of their daily occupations, may rage and attempt to sting, but he continues to satisfy his hunger unmoved by the clamour that surrounds him.

We have no particulars to relate respecting the Woverine, of North America (*Galeo wolverine*), the Grisons and Faira (*G. vittatus* and *G. barbatus*). The first is conjectured, by the editors of CUVIER'S *Animal Kingdom*, to be no other than an American variety of the common Glutton. The second, and third, common to all the warmer regions of the new world, are generally rapacious, and diffuse a musky odour. Their feet are slightly flattened, and it seems that they have been generally mistaken for otters. But modern naturalists have corrected this opinion, and the vast rivers of America may lay claim to several members of the otter tribe, as peculiarly her own. Travellers may see them basking in the sun, on the banks of the Orinoco, where they appear somewhat larger than the common otter, brown, or fawn-coloured, with a white or yellow neck. They may further trace them along the shores of the great river of the Amazons, shaded with primeval forests, and beside the

. . . sea-like Plata, to whose dread expanse,
Continuous depth, and wondrous length of course,
Our floods are rills.

To them they may recall the rude scenes and inclement climates in which the European otter is found. He who has trod the thresholds of the western world, can alone appreciate the vividness of such emotions. "From the first time we landed," says one of the editors of CUVIER'S *Animal Kingdom*, "on the shores of the Southern Atlantic, we were never wearied with admiring the varied forms of animated nature, which as we advanced towards the south, presented new

animals to our view. We felt an indescribable emotion, when, on passing from one hemisphere to another, we no longer recognised the domestic animals with which we had been familiar from early life; when the camel gave place to the llama, the deer of our forests to the carabou, and the sheep to the vicunna. Nothing, perhaps, awakens in the traveller a livelier remembrance of the immense distance by which he is separated from his country, than such transitions. The sight fills with admiration, even those, who, unacquainted with scientific subjects, feel the same emotions of delight in the contemplation of strange animals, as in the view of a beautiful landscape, or a majestic ruin. A traveller requires not the aid of botany to recognise the torrid zone, from the mere aspect of its vegetation; and without knowing anything of zoology, he feels that he is not in Europe, when he encounters stately herds of prong-horned antelopes, that range the borders of the Missouri; the agouti, that represent in the Antilles, and throughout the warmer portions of America, the hares and rabbits of the old world; the pumas that start from out the majestic forests which clothe the high calcareous Alps of New Andalusia, or range those coasts, where a bright and clear sky, with a few light clouds at sunset, reposes on the peninsula, destitute of trees, and on the plains of Cumana, while the clouds pour forth their fertile showers among the inland mountains."

The Common Fox (*Vulpes vulgaris*) of the transatlantic world is not less conspicuous for cunning and rapacity than his brethren of the ancient continents. Strong, and active, with a head to con-

trive mischief, and ample means to circumvent his prey, he may be seen prowling through the woods, and across the plains of those vast regions. But his favourite haunts are in the forests of the Andes, amid those lofty mountains, which seem to rest on others, and rise to a surprising height, shrouded with snow that never melts. He is seen too, around the base of the terrific Cotopaxi, and even in those wild deserts that bound the confines of the vegetable world, beneath the empire of perpetual winter. There grows a kind of rush, resembling the *Genista Hispanica*, among which he delights to harbour. Trees also, of commanding height, afford him a secure retreat; the quinal, well adapted to resist the severest cold; the quineia, of which the smallest branch, when kindled, yields a light equal to that of a torch; the achupalla; and a vegetable called puchugchu, resembling a loaf, and of so firm a texture, that the stamp of a heavy foot, or the tread of a mule, makes no impression on them, till fully ripe. These are the vegetable aborigines of the soil, where either from the intense cold, or the perpetual snow, or from the sterility of the earth, nothing else is known to vegetate; except, indeed, the calaquala, a climbing plant, which spreads itself in thin stems along the sand, or runs up the rock by means of tendrils. Here, then, is the favourite resort of innumerable foxes, crafty creatures, which seem to exult in the fastnesses by which they are surrounded. But how they contrive to subsist, throughout the long and severe winters, is altogether inexplicable. The rocks are then covered with snow, the deep primeval forests afford no means of living, the

lonely wilderness is deserted both by small animals and birds, and the thinly peopled country affords few opportunities of committing depredations. And yet even such of the prowling brotherhood as reside on the verge of cultivated lands, do not make their wonted visits to the hen-roosts, during winter. Their foot-prints are never seen on the snow around the farms, although these are nightly infested in the summer season.

The Carnivora of America are fewer than those of the ancient continent. At the head of these stand the Conguar or Puma, (*Felis concolor*,) the lion of America, so called, from a certain similarity of colour with his royal brother; but though they are aboriginal throughout the greater part of the American continent, Baron Cuvier has not been able to ascertain any varieties of race. D'Azara tells us that he is less ferocious and more easily destroyed than his relative the jaguar, that he lies concealed among underwood, and never flies for refuge to a cavern, however closely pursued; and, further, that he climbs the loftiest trees, though rather affecting the plain than the forest. Anxious to confirm the opinion of America's first historians, that the animals of the new world were decidedly inferior to those of the old, D'Azara also states, that the Puma never attacks a man, rarely a dog, but timidly avoids them; that his depredations are generally confined to quadrupeds of a middle size, such as calves and sheep; and that against these, his ferocity is more insatiable than his hunger. He destroys many at a time, but carries away perhaps, only one, concealing

the remainder for a second repast, in which respect he differs from the jaguar, who is not so provident.

But the extreme ferocity of the Puma, even against the human race, has been sufficiently proved. Two hunters went forth, in quest of game, on the Katskill mountains, near the road from New York to Albany, each armed with a gun, and accompanied by his dog. It was agreed between them, that they should go, in contrary directions, round the base of a hill; and that, if either discharged his piece, the other should join his companion, and aid him in pursuit of the game. Shortly after separating, one of the comrades heard the other fire, and hastened in consequence to the place from which the sound proceeded; but great was his alarm, when, on reaching the spot, and searching diligently in various directions, he found the dog lying dead, and dreadfully torn, as if he had been engaged in a mortal fray. Apprised by this that the enemy was large and ferocious, he became anxious for the fate of his companion, and assiduously continued to search for him, when his attention was suddenly directed by a deep growl, to the branches of a large tree, where he saw a Puma, crouching on his mangled body, apparently hesitating whether to descend and make a fresh attack on the hunter, or to relinquish his prey, and take flight. Conscious how much depended on celerity, the hunter discharged his piece, and mortally wounded the ferocious creature, who fell, with the body of his victim, from the tree. The dog, then flew at the prostrate beast, but a single blow from his paw laid him dead in a moment. The hunter, finding that his unhappy friend was

beyond the reach of assistance, and that he could not safely approach the formidable animal, hastened from the spot, and returning as quick as possible with several persons, in order to remove the body of the hunter, he found the Puma, and both the dogs, lying dead together.

Yet, notwithstanding his natural ferocity,—and who will not endeavour to defend himself when attacked?—the Puma is easily domesticated. Major Smith met one day a waggon, in which was seated an individual of the species. He seemed contented, and gladly eyed some pieces of meat that were thrown into a neighbouring tree. The chain was curled round his neck, and on his keeper telling him to bring down the pieces, he sprang after them with surprising docility and ease. D'Azara, had also a Puma in his possession, which was as gentle as a dog. He would play merrily with any one, and if an orange was presented him, he would strike it with his paw, then push it away, and seize it again, in the manner of a cat when playing with a mouse. He had all the engaging ways of this domestic quadruped, he would purr, and move his tail, when pleased; and when anxious for his food, his attitude and bounds resembled her's, while watching to seize a bird.

We may presume from the narrative of Captain Head, that these animals abound on the great plains, or pampas, to the east of the Cordillera. In that wild expanse of waving grass, no trace of human beings meets the eye, unless, occasionally, the picturesque outline of a Gaucho*, with his scarlet mantle stream-

* A race of men inhabiting the plains.

ing horizontally behind him, his ornamented balls flying in the wind around his head as he bends over his horse's neck, while urging him towards the prey, the fiery creature seeming to share his eagerness: before him, striding the wild ostrich, with her head stretched out, and her wings lifted up on high, as if she scorned the horse and his rider; a magnificent object, which continually distances the pursuer, while the Gaucho's horse is often lost sight of below the horizon, though his stately head still shows that the chase is undecided.

The borderers on these vast plains are endowed with a species of sagacity, which is common to those who live in wild open countries: it is that of being able to trace the footsteps of either men or animals, where the impression is too faint to be discovered by those who are accustomed to the habits of civilized life; and to judge by a combination of trivial circumstances, what has occurred, or may be going on, at a great distance. Captain Head notices a striking instance. While riding with a Gaucho, and admiring the beautiful serenity of those extensive plains, he was suddenly roused from his reverie by his companion, who pointing up to the sky, exclaimed, "See, there is a lion." Captain Head strained his eye, but to no purpose, until the Gaucho showed him, high in air, a company of vultures, hovering with expanded wings. "They are stationed there," said he, "because just below, a lion is devouring some carcass, and he has driven them away."

But the favourite resort of this fierce creature is a cane-brake; the haunt, too, of bears and jaguars,

which find there a safe retreat from man. These brakes are common on the lower sources of the Mississippi and Arkansas, and beside the banks of the Red River. The canes, which are much used for angling rods, rise from fifteen to thirty feet in height, with beautiful green leaves, long, narrow, and dagger-shaped, not unlike those of the Egyptian millet; the stem has equidistant joints, and when growing in large numbers, they form a splendid feature in the Transatlantic landscape. Seen from a distance they appear like a solid body; for a thousand stems often rise contiguous, so dense, so firm, and so unyielding, that even the smallest bird would find it difficult to enter, and a strong man could not force his way, to the distance of three miles, in a long summer day. This interesting plant uniformly denotes a dry and rich soil, and the ground is never better prepared for planting maize, than after it is cut down and burned. The labour is great, but the hope of an abundant harvest cheers the workman at his toil. When the rich mass of vegetation is brought low, and dried in the sun, the next care is to burn it, which affords no small amusement to the settlers. The rarefied air, in the hollow compartments of the cane, causes them to burst, with a report equal to that of musquetry, and those who heard the strange sound from afar, would think that armies were contending.

This beautiful plant flourishes for about five years, at the end of which it produces an abundant crop of seed, resembling that of the broom-corn. The seeds are farinaceous, and are often used as an excellent substitute for wheat. When seen at a

distance, or even near, the cane-brake presents a splendid object; for though, if it be fully grown, strong animals alone attempt to force their way through the mass of vegetation, yet when young it affords a rich and perennial pasturage for cattle; rising from the ground like asparagus, with large and juicy stems, and thus it continues, succulent and tender, till at least six feet high. In this state it also furnishes abundant fodder, and butter made from cane pasture is of the finest kind.

Such, then, is the favourite resort of the majestic Puma. He is undoubtedly the fiercest creature on the continent of America; more powerful and courageous than the wolf, and his ferocity and agility render him an object more to be dreaded, than even the unwieldy bear.

A wild and heathy tract extends upon one of the tributary streams of the Alleghany: its soil was by nature remarkably fertile, and hence, though remote and lonely, it was settled by some adventurers from the states of New England. A few years sufficed to clear away the trees from a narrow belt running parallel with the mountain stream, above which rose, precipitously from the valley, a succession of rocky ledges, covered with timber of luxuriant growth. During spring and autumn the cleared portion of the meadow land became the favourite haunt of the deer that abounded upon the border lands of the Alleghany river. Hunters consequently resorted thither, who concealed themselves among the loose fragments of the rocks, and awaited the approach of game. A hunter, who gives the following interesting narrative, had kept his sta-

tion for some hours, till wearied with watching to no purpose, he resolved to proceed into the woods which skirted the upper portion of the clearing. Onwards he went, and shortly came upon the body of a large deer, which evidently had been just killed by some ferocious animal. Its death-wound was not the deed of man, nor had it been run down by the dogs of any of the neighbouring hunters; or else their voices would have echoed from rock to rock, and from hill to hill. Carefully did the hunter then proceed, for there was danger in his path; he examined the various tracks, and looked anxiously both far and near, but he could discover no indication of any living creature, and the surrounding forest was as silent as the tomb. Considering the deer, therefore, as his lawful prey, he seized him by his noble antlers, and was proceeding to drag him toward the cleared ground, a little further down the valley; when, stopping to rest for a few moments, and looking accidentally behind him, he beheld, to his great dismay, an enormous Puma advancing slowly upon his track. The hunter moved forward, and then looked back again to observe the intentions of his pursuer, (whose movements seemed regulated in great measure by his own,) for it is not safe to fly at the first glance, or to seem dismayed, when a beast of prey approaches. But still the Puma advanced in the track, and when the hunter quickened his pace, he also did the same. Judging it, therefore, prudent to abandon the object of contention, and, never suspecting for a moment that he had any wish but to regain his lawful prize, the hunter proceeded calmly on his way. But great

was his astonishment when he saw the animal pass disdainfully over the carcass with the apparent intention of giving him chase. The danger was urgent, for the rifle of the hunter could be of little use, and it was not desirable to await his coming. He sought safety, therefore, by springing up one of the rocky ledges, and clambering over its ragged points to the height of about eighteen feet, to where a small chasm afforded a resting-place of comparative security. But the Puma thought otherwise. He advanced boldly beneath the ledge, then falling back, as if to reconnoitre the position, he seated himself for a few moments and eyed his victim, with a front indicative of no pacific or compromising purpose. Convinced that not a moment was to be lost, the hunter now raised his rifle, but it trembled in his hand, like the leaves of the wild poplar tree. Many a ferocious creature had fallen before that rifle, but now, for the first time, the master rested it upon the point of the projecting rock, and bent his body so as to enable him to bring his eye to the level of the gun. Deliberately did he then take aim at a small bright spot of fur on the fierce creature's breast, and instantly drew the fatal trigger. In a moment the ball entered, and the death-stricken animal made a tremendous spring towards the ledge. He struck the rock two or three yards below the hunter, and uttered a cry so grievous and appalling, that years elapsed before that fearful cry ceased to haunt him at intervals. But the Puma's strength soon ebbed; he fell heavily back, drawing in his breath with such force that the blood reverted to his heart with a loud gurgling noise.

Again he bounded upwards to nearly the same height; again the same terrible yell was heard, and a second gush of blood from his death-wound, and again did he tumble to the earth, while his eyes gleamed with a deadly crimson hue. All seemed to be over. But suddenly he sprung up once more, and dashed furiously against the rock again and again, though evidently growing weaker at every effort; till becoming entirely exhausted from the loss of blood, he turned his rage against the earth, which he tore up, with the most terrible fury, and rent with his teeth every object within reach. It was a hideous sight, and such was the horrid fierceness that settled in his glazed eye, that the awe-struck hunter would not descend from his place of safety till he had discharged a rifle-ball through his head, and saw the dark blood ooze slowly from the orifice.

Nor is it alone in open warfare that the Puma is thus formidable. He will lurk in ambush like the tiger, and dart upon his unsuspecting prey. The same intrepid hunter again encountered one of the tribe in circumstances of peculiar danger. He was returning homeward in the evening from an excursion in the woods, with the dog gambolling beside him, while the sunbeams glanced through the scarcely-moving leaves, and beautifully-coloured birds flying in all directions seemed hastening to choose their coverts for the night. Impressed with the loveliness of the scene, the hunter stopped for a moment to admire the setting sun, which shed a brighter radiance on the forest, and lighted up, with a vivid glow, its shadiest recesses, when suddenly

his dog, which had sat down in playful mood, and was pulling a tuft of grass beside him, began to utter a whining howl, and hastily retreated to his master's side, with his eyes directed to the foliage of a branching oak, immediately in front. The master also looked, and saw the frightful visage of an enormous Puma, as he cunningly crept towards the end of a near branch, with the evident design of springing upon his intended victim. It was a solemn moment. The thought of home and family rushed upon the hunter's mind, yet there seemed little probability of escape. To fly was impossible, to remain still was equally dangerous; for the glaring eye-balls of the savage creature were fixed upon him, regardless of the answering look of the stern wolf-dog, as he moved slowly and cautiously along the extended branch, uttering through his slightly opened mouth a low hissing sound, which resembled the signal cry of the deadly rattle-snake. This was the moment of attack; but scarcely had he prepared to dart, when the branch gave way, and down he fell with a mingled howl of rage and disappointment that might have been heard for miles, through the silence of the forest. The wolf-dog, though in general a bold and fearless creature, was too much daunted to avail himself of the momentary advantage; and the Puma, recovering with a bound, darted fiercely up the tree again, making the very branches of the innumerable forest-trees tremble with his loud and terrific cries. Suddenly turning round, he swiftly advanced along a limb of the stately oak on the side nearest to his intended prey, glaring down upon him with a look of increased

malignity; and uttering at the same time a terrible yell, he threw himself into the attitude of springing. If the hunter had hoped for one moment that the fierce creature, confused by his fall, might have changed his intention, that hope now vanished. Collecting, therefore, all his energies, upon the desperate hazard of a shot, he fired. The next moment the creature seemed to dart with terrible fury upon him; again the thought of home and family flashed across his mind, for he knew not that the ball had entered a vital part; and if it had not entered, all hope of life was inevitably gone. But that gracious Being, who had often protected him in scenes of danger did not permit him to perish amid the loneliness of the forest. The convulsed form of the terrific animal plunged heavily upon the earth, and rolling along the leaves which had fallen from the trees, dyed them with a copious stream from his heart, which the unerring ball had reached as he was in the very act of bounding. The dog now darted furiously upon the monster, but no attempt was made to repel the attack, no limb was moved or convulsed, all sense and feeling had departed,—the creature was quite dead.

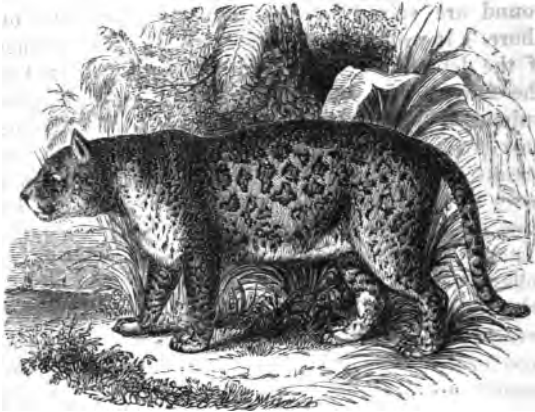
The ferocious Jaguar, or Tiger of the New World, (*Felis jaguar*,) abounds in Paraguay and Guiana, in Mexico and the country of the Amazons, where he makes great havoc among the flocks, and is even formidable to armed men. M. Sonini de Manoncour informs us that in passing through a vast extent of wooded country, his party were harassed for two nights by a Jaguar, which continued to follow them, notwithstanding a large fire that was kept

burning. He roamed round, like the fabled wild huntsman of Scandinavia, and the travellers found it impossible to shoot him; no sooner was he aimed at, than he as rapidly disappeared, then returned on the other side, and occasioned a perpetual alarm. Thus he proceeded, till wearied at length by the resistance which he met with, and by the sight of blazing fires continually augmented, he sullenly withdrew with dreadful howlings.

Jaguars are often seen in the deep forests of Demerara. "You no hear tiger, massa?" said an Indian to Waterton, as he lay awake in his hammock. Waterton listened attentively, and heard the softly-sounding tread of his huge feet. The moon was set, but every now and then the flickering flame of the fire made him visible, and the spots on his coat clearly indicated that he was a Jaguar. The Indian wished to fire, but Waterton would not allow it; he longed to see a little more of the new visiter, for it is not every day or night that an undisturbed view can be obtained of a Jaguar in his native forests.

Whenever the fire got low he came near; when the Indian threw on fresh fuel, and the flame burst forth, he hastily drew back. Sometimes he advanced within twenty yards, and then he was seen to great advantage, sitting on his hind legs, like a dog. Again, he moved slowly to and fro, and at other times he would mend his pace, as if impatient. At length, the Indian, not liking the vicinity of such a formidable guest, set up a tremendous yell, which was repeated by all the echoes, far and near. On hearing this, the Jaguar bounded off like a

race-horse, and returned no more. When day dawned, it was apparent, from the print of his huge feet, that he was full-grown.



THE JAGUAR.

Jaguars are very numerous on the wooded banks of the Essequibo; they kept up a continual roaring every night while Waterton continued there. The sound was awfully fine; sometimes it was in the immediate neighbourhood, at other times afar off, and resounded among the hills like distant thunder.

These animals are solitary, they hunt by night, and inhabit the thickest forests, such especially as clothe the precipitous banks of great rivers. You may see them, when the moon shines bright, stationed along the shore, or on some broken rock

that starts from out the stream. The Indian will tell you that when thus stationed, they drop their saliva into the water, and this attracts by its novelty the unsuspecting fish, who while swimming round are seized by the Jaguar and thrown on shore. It would be well for the American farmer if the depredations of the Jaguar were restricted to the finny tribes, but he often destroys the largest animals by leaping on their backs; and placing one paw upon the head, another on the muzzle, he breaks the neck of his victim. In this manner cows and horses frequently become his prey; he then drags them with his teeth to a considerable distance and devours them at his leisure. D'Azara tells us that he once ordered the body of a horse, which had been destroyed by one of these fierce creatures, to be drawn within musket-shot of the tree in which he intended to pass the night, lest the Jaguar, who had evidently been disturbed, should return when evening came on in order to seize his prey. But while D'Azara was gone to prepare for a probable rencontre, the animal came back from the opposite side of a large and deep river, and having seized the horse with his teeth, drew it for about sixty paces to the water's edge: he then plunged in and swam with his victim into a neighbouring wood; and this was done so instantaneously that the person whom D'Azara had left concealed was unable to give the least alarm.

The natives hunt the Jaguar in his wildest fastnesses by the assistance of fierce dogs; and these, though unable to vanquish, drive him to take refuge in some thicket or cavern. From the first

he is easily dislodged with fire-arms or lances, but not so readily from the second; yet some of the Indians occasionally venture to approach him, carrying spears, and having their left arms covered with a sheep's skin; a temerity too often followed with fatal consequences. The traveller who unfortunately falls in with this fierce animal, especially after sunset, has little time for consideration; should he be urged to the attack by hunger, not even fire-brands, so terrible in general to ravenous creatures, nor the loudest shouts, avail to frighten him; nothing short of the celerity of a musket-ball can anticipate his murderous intentions. The aim must be quick and steady; life or death depend upon the result.

Many parts of South America, once grievously infested by Jaguars, are now free from them, or only occasionally subjected to their incursions; for however terrific, they, in common with all their rapacious brethren, are easily exterminated by the use of fire-arms. Such also is the case in the ancient continents. Tigers used to swarm in the wild jungles of Currah and Camaulpoor, but, since the country has been settled under the British government, they have gradually disappeared, and they will soon become as rare in the East as in the West. Reptiles of various descriptions retain their hold in a country much longer.

The Puma and the Jaguar will seldom attack men except under the excitement of fear or hunger, but they wage continual war upon the smaller animals, roaming along the sea-coast and in the neighbourhood of houses. Should, however, their intended victims boldly repel them, they may be often seen to dart

away as swiftly as they came, and to take refuge among the trees. They likewise destroy caimans, or alligators, lizards, and such fish as come within their reach; for they swim well, and traverse the largest rivers in quest of prey. When about to attack the alligator, they lie down on the margin of the river and strike the water with their tails; the unwary creature, surprised at so strange a sound, lifts up his head above the stream, and is as instantaneously seized by the foe, who kills him with a sudden spring, and drags his body to land, where he is devoured at leisure. Thus they render invaluable services to those who live in the vicinity of marshy places, and on the banks of such sea-like rivers as swarm with reptiles. The Indians relate further, that Jaguars attract the alligator by counterfeiting the cry of a child, and the agouti, by mimicking his well-known voice. In a captive state, all their formidable qualities disappear; they become gentle and confiding, and hence the character of cowardice has been erroneously fixed upon them.

The Jaguar feeds occasionally on the buds and tender leaves of the Indian fig, and while ranging over the vast savannas of the New World he sometimes wishes to regale himself with a land-tortoise; but all his efforts are vain: his formidable teeth cannot break the shell, nor can a stroke of his huge paw do the inmate any damage; it is so compact and strong that, according to the common proverb, a London wagon might roll over it without endangering the inhabitant. When a tiger, therefore, approaches, the tortoise never thinks of moving, but

quietly withdraws his head beneath the shell; in vain the hungry brute roars and rages, it is all nothing to the tortoise, he turns a deaf ear to the clamour, and goes quietly to sleep. Thus cased in an impenetrable coat of mail, he has only two enemies to fear. One of these is the boa constrictor, that dreadful serpent which has been known to swallow a live tortoise; but a boa large enough for such a feat is happily not often seen. The other enemy is man, who takes up the tortoise and carries him away; but man also seldom traverses those wilds. Yet, still, when he does appear, it is as a terrible enemy to the tiger. The Gaucho, who inhabits with his brethren the wildest parts of Paraguay, frequently sets forth to attack the animals that shelter amid the fastnesses of those untrodden deserts. Mounted on a well-trained courser, and carrying in his hand a long rope with a noose at the end, he urges his fiery steed into a troop of wild horses, and catches one of them by the aid of his rope. He then dismounts, whirls another rope around his prey, who becomes completely entangled and, without putting on either a stirrup or bridle he springs upon the back of the impatient animal, which rages and paws the ground and darts away with the rapidity of lightning. But this is only for a moment: the creature, indignant at his burden, soon stops, begins to prance, rolls in the dust, and endeavours to unhorse him; but the Gaucho keeps his seat, and again the fiery courser rages onward, rushing up steep rocks, and swimming rapid streams, clearing precipices, and leaping over obstacles that would destroy a less practised rider; at length,

worn out with fatigue, he falls to the ground and submits. But it is not sufficient that the horse becomes obedient, and carries his master from one country to another, he must also brave the same dangers, and second him in his most hazardous exploits, he must even face the tiger, an enemy from which he turns away with instinctive dread.

All this is comparatively the work of a short time. The creature which a few hours before had ranged the wide expanse of the desert, free as the air he breathed, now submits to the voice of a master, and in resigning his natural liberty seems actuated solely by the will that guides him. A few hours more, and he goes forth to face an enemy whose deep and sullen roar would but yesterday have made him tremble, and turn round and speed away like a rolling thing before the whirlwind. It is not force but skill that conquers: the Gaucho soon spurs his horse towards the monster he intends for a victim, whirls his noosed rope, and shouts aloud to tell him that he is ready. Meanwhile, the terrible Jaguar crouches on the ground, astonished that any living creature should await his coming: rolling his glaring eyes, and opening his vast jaws, perhaps red with the blood of his prey, and indignant at finding an opponent, he seeks narrowly for the place on which he intends to spring. The Gaucho, unmoved by these terrible menaces, governs his obedient courser with his feet, and makes him retreat without turning his face from the Jaguar, who cautiously advances, and follows, step by step, watching for a false movement. The Gaucho knows this, he therefore makes his horse rear up, upon

which the tiger darts forward, and is caught in the noose; the horse then springs away with all his power, and drags the ferocious beast after him. Onward they proceed, the Gaucho, his horse, and the Jaguar; but if, on looking back, the hunter perceives that the noose has only caught the neck of his victim, he throws another around his legs. When he is thus doubly entangled, all resistance is vain, and the Gaucho, dismounting at his leisure, dispatches his enemy with the knives which he carries in his boots.

Should it happen that the noose has missed, and that the Jaguar rushes boldly forward, the hunter defends himself with his knives. The horse sees the danger to which his master is exposed, and instead of galloping away, presents his own chest to the enemy. He is often wounded, and his blood begins to flow, but his courage never forsakes him; he seems to know that the master, for whom he has risked so much, will not leave him to perish. If the Jaguar, exhausted with fatigue, allows the horseman one moment's respite, all chance of victory is gone; the fatal noose, which is always ready at the saddle, is again laid hold of, and no instance is yet known in which a Gaucho has twice missed his aim.

Connected with the subject of wild horses, is the extraordinary fact, that the increase of these animals in Brazil, where none of the same genus existed before its discovery, altered even the physical features of the country. Bulbous plants and the numerous kinds of aloes, or agaves, with which the plains were overspread, gradually disap-

peared, and in their place the ground was covered with fine pasturage, and with a species of creeping thistle, hardy enough to endure the trampling by which the former herbage had been destroyed. The insect, as well as the vegetable world was affected, and the indigenous animals, including both birds and beasts of prey, acquired new habits*. Probably the same effect has been produced in Paraguay, unnoticed by any naturalist, yet still existing.

The Canadian forests abound with a distinct species of Lynx (*Felis canadensis*), and those of the United States, with a smaller kind (*F. rufa*), to which the name of American has been generally given. Ocelots, also, range over the whole of that vast continent; wild cats of different species, lurk in their leafy citadels, and the black and red, with crab wolves (*Canis cancrivorus*, *C. jubatus*, *C. lycaon*), inhabit the Floridas, Paraguay, and Guiana.

The Canadian Lynx is seen with his companions, in the vast prairies of the Flatte; and when, during night, they roam abroad for prey, they venture very near the encampment of the traveller. They then often join in packs, for the purpose of chasing the deer, which they frequently run down. Yet this is a difficult achievement, and even their swiftness, and their cunning, are so often unavailing, that they are reduced to the necessity of eating wild plums and fruits, to appease their hunger. Their bark resembles that of the domestic dog, and is succeeded by a lengthened scream.

* SOUTHBY'S *Brasil*.

In speaking of those woodless prairies, the abode of innumerable wild creatures, it may be interesting to notice the difficulty of ascertaining their distance, size, and relative positions. This is increased in fine weather, when the heavens are covered with flying clouds, the shadows of which, coursing rapidly over the plains, seem to put the whole in motion, till a traveller feels as if riding amid the unquiet billows of the sea. Distant hills and promontories, with here and there an insular group of trees, render the illusion more complete. Thus circumstanced, it is almost impossible to estimate the real magnitude of objects, and a small animal, such as a dog or wolf, sometimes appears to equal a horse in size. Three elks, noticed by the enterprising travellers to the Rocky Mountains, as the first which they had seen, seemed almost gigantic. For a moment they fancied that they had discovered the mastodons of America, dwelling unmolested amid scenes in unison with their enormous bulk. Nor is this illusion confined to the prairies of the Flatte: it frequently occurs on extensive plains, especially if the object within the reach of vision be at all new to the beholder; inaccurate ideas are consequently formed, both with regard to size and distance, unless some well-known object approaches; then the illusion vanishes, and all things return to their proper dimensions. The following striking anecdote may serve to illustrate the truth of this remark. Soon after the party had left their encampment, on one of those bright sunny mornings which occurred when they were in the country near the sources of the Grand River, they

thought that they discovered several large animals feeding in the prairie, at the distance of half-a-mile. These, they believed, could be no other than huge bisons, and after much consultation on the best method of surprising them, two of the party dismounted, and stealing cautiously about one-fourth of a mile, arrived near the place, where fed, as they imagined, the terrific bisons; but great was their surprise, when, instead of shaggy manes, and horns prepared for battle, they saw only a quiet turkey, leading on her brood of half-grown young.



THE CHATI, (*Felis colocolo*.)

The Chatī (*Felis colocolo*), of M. Cuvier, which approximates to the chervals and tigers of the old world, next engages our attention.

This fierce creature was shot in the interior of Guiana, by an officer of Lewenstein's riflemen, and placed on the awning of the boat, while coasting down the great river Paramaribo. Ancient trees grew on either side, and spread their branches over the margin of the stream, drooping occasionally even to the water's edge, and affording resting places to innumerable monkeys, who silently and intently observed the motion of the vessel, though apparently not alarmed by the novelty of the spectacle. But no sooner did the stuffed specimen come in sight, than the whole party trooped off with loud screams and howlings. Their excessive terror clearly evinced, that to them the Chati was an enemy of no ordinary kind.

Those extensive forests, through which the great river Paramaribo often flows in its winding course, abound in timber trees of the largest size, and in such as produce gums and spices. There grows the stately mora, concerning which we have already spoken, as often lifting up to light and heat, a usurping progeny of parasitic plants; the wallaba, the selvabali, bulletre, and purple heart, the lauriere, caca, and grigris, majestic trees, whose straight and branchless stems, after rising to the height of sixty or seventy feet, are crowned with a magnificent entablature of waving foliage.

Scarcely less imposing is the bully tree, fifty feet high; the lofty chatanier grande feuille, resembling the chestnut in size and beauty; and the inflammable hericheri, whose branches, when kindled to a flame, burn so fiercely, that no wild animal dares approach them. The Indians know this tree, and when

halting for the night on their hunting expeditions, they spread their skins beneath its shade, and keep up their watch-fires with its boughs.

A man erecting his habitation in the depths of these almost interminable forests, could readily obtain all that his necessities require, and even luxuries and comforts, from the vegetable productions that surround him. The palisada tree, a species of wild palm, would furnish durable timber for the side-wall of his house; the wood of the olivier, which burns with difficulty, shingles for the roof and chimney; and then, for tiles, he might use the broad umbrageous leaves of the wild trooly, at least twenty feet in length; for wainscotting or furniture, the beautiful brown letter-wood, spotted like a leopard's skin, or varied with marks resembling hieroglyphics, or else the purple heart, so called from the Tyrian colour of its wood when dry. Around him, for either use or ornament, might be collected in his forest walks, the maan tree, producing a fine resinous gum, which, when made into tapers, imparts a clear and pleasant light: the dali, bearing a berry, yielding wax; the silk grass, with its small tenacious fibres, that make strong thread; the cockarito palm, affording excellent cabbage; the plaintain, crowned with ripe fruit; the mastick tree, and cow tree, the palo de baca, of Venezuela, from which exudes a rich and delicious milk, rising on the rugged side of some acclivity open to the sun, in places, especially, where the thick and tangled underwood renders it impossible for cattle to find pasturage, or where a rocky soil forbids the growth of grass;

medlers and quavas, pappaws and apple trees, marmalade and plum trees, are also within reach. The soil, too, when cleared of timber, yields an abundant increase; the manioc and cassada, potato and igname, the cariacó, a sweet and profitable grain; and the tages, a productive root, the principal food of such domestic animals as man collects around him, wherever he has fixed his abode. Coffee, plantains and pepper thrive, and amply repay the labour of cultivation, with such trees and shrubs as bear dates and figs, grapes, and spices, nutmegs, cloves, and cinnamon: dyeing wood, of various descriptions, with cochineal, wild honey, and gum copal, might also be met with in the forests; while the most sunny places yield physiconuts, and palma christis, quassia roots, and ipecacuanha. Thus easily might an enterprising man collect around him, those comforts and even luxuries, which the Europeans often purchase at a costly price.

This also, is a land fertile in parasitic plants. The bois jourmi, with its crooked and ramifying branches, covered with tubercles, which afford shelter to innumerable ants; the favourite resort, too, of wild pigeons, whose deep melancholy cooings are heard at intervals in the silence of the forests; the bois viviere, and rose mahout, with others of rapid growth and wild tracery of leaves and branches, are often covered with a luxuriant vegetation of creepers or parasitic plants. Among these we may briefly notice, as one of the most elegant, that beautiful creeper, the *Coryanthes maculata*, which hangs forth its fairy buckets, as if for the refreshment of such thirsty birds and insects as must

otherwise fly far in quest of water. Scarcely does the wide extent of the vegetable kingdom offer a more beautiful instance of evident design, than this graceful plant. A yellow cup is seen suspended from the lip of each blossom, into which two horns continually distil a sweet pure liquid. The cup communicates by means of a groove, formed from the inflated margin of the lip, with a capacious helmet-shaped vessel, into which the liquid when too abundant, runs from the cup. This plant grows also in the woods of Demerara. Doubtless there are many others of a similar description, which compensate, in a great degree, the want of water. For a considerable portion of British Guiana was, indeed, a thirsty land, till the important discovery made by Colonel M'Turk, of a large inland lake, the waters of which he conducted by means of a canal to George Town; and subsequently of the wells, which have sprung up in consequence of boring. This remark applies, especially, to that extent of country which borders the sea, and goes many miles inland, formed of an accumulation of decayed vegetables, mixed with earth, to the depth of one hundred and fifty feet, and yielding a rich loam: beneath which, and at a considerable depth, large forest-trees have been discovered, in a state of perfect preservation, on the east banks of the river Demerara, near its entrance into the Atlantic, and another similar stratum, partly decayed, at about seven feet below the surface of the earth.

How valuable must be the coryanthes, holding forth its brimming goblet to small birds and insects, when, resting in their noon-day flights, they look

in vain for some clear streamlet, in which to quench their thirst. How grateful, too, the cups filled with rain-water, which are often found in the branches of the cuba or wild cotton tree, formed by the peculiar configuration of the leaves of a species of pine, each leaf holding a quart, which while it refreshes the gigantic trunk of the friendly cuba, it affords a welcome draught to the weary traveller.

This noble tree offers one of the most imposing spectacles in nature. It may be seen towering to the height of nearly one hundred feet, a majestic column, clear of branches till within twenty feet of the top, and, at its base, spreading forth its principal roots above the ground, as if bracing itself against the tempest. High over head, and often covering a space of nearly two hundred feet, the ample branches of this stately tree, spreading forth horizontally and symmetrically, form a canopy, for width and grandeur, worthy of the trunk below. Curious is it to observe the numerous families that find here a safe retreat. The towering cotton tree is a world in itself, peopled with innumerable living creatures, and often supporting a colony of parasitic plants. The wild pine apple grows luxuriantly on its topmost branches, vines vegetate on its extended limbs, and run downwards to the earth, coiling like ropes, and yielding, when cut, a pleasant and refreshing juice. They serve, too, as rope-ladders to various animals; rats and mice, monkeys, squirrels, and opossums, who would find it difficult to ascend the smooth and branchless trunk, run up them with the greatest

facility, and drink from out the cups formed among the branches. Communities of little bustling creatures, the comajen or wood louse, often fix their habitations on the trunk, where, like a Chinese population, they seem almost innumerable. The slippery bark, which offers an impediment to even the swiftest climber, presents no obstacle to them. Carrying pellets of earth in their mouths, and attaching them, most probably, to the bark, by means of some glutinous exudation, they rapidly erect their city; and from this they form several covered ways to the ground. One is evidently intended to shelter the inhabitants in going down, another in coming up; if the community is very large, several are erected; but if small, two suffice for every necessary purpose.

Guiana also is the country of the Indian rubber tree, or caoutchouc, which grows, in company with the teak tree, within twenty degrees north and south of the equator. The nature and the properties of its valuable juice have recently been much examined by scientific men. They have succeeded in discovering that it is slightly analogous to silk; and that every plant which nourishes the silk worm, contains a larger or smaller quantity of caoutchouc; such as the lettuce, the dandelion, and the mulberry. We also learn from a recent traveller in the Brazils, the interesting fact, that, wherever the caoutchouc abounds, large moths, at least two or three inches in length, are known to produce excellent silk. He endeavoured to naturalize them in this country, but could only succeed to a limited degree, being



INDIAN RUBBER TREE.

unable to procure the leaves on which they principally feed. Various are the purposes to which the Indian rubber is now applied; from a lady's watch-guard, to the cable of a ship; and hence it has become an important article of commerce. Although its valuable qualities have remained so long unknown in Europe, the ancient Indian kings of South America knew how to apply them many ages since.

There is a tree growing in the hot country, thus quaintly writes a Spanish writer in the sixteenth

century, "which is held by the Indians in great estimation. It does not grow high, but the leaves are broad, and of an ashy hue. This tree yields a white milky substance, thick and gummy, and abundant. The natives wound the tree with an axe or cutlass, and from these incisions the liquor drops. They catch it into round vessels, small and large, which they call *xicalli*, but the Spaniards calabashes; in these they allow it to settle in round balls, and when set they boil them in water. Those who cannot obtain vessels for the purpose, smear their bodies with the juice, for nature is never without a resource; they wait patiently beneath this curious covering, and when dry, remove it with little trouble, as it comes off in the form of a smooth membrane, its thickness depending upon the will of him who gathers it. They then make it into balls, which are boiled as just noted. Anciently the Indians used to play with these balls, striking them against the ground, and causing them to rebound to a great height; but in the game of the *Pelota* they were not struck against the ground, but caught upon the hip or shoulder.

"But this was not their only use, nor were they given merely to be sported with. An oil was extracted from them, of great value in various applications. It was much used by the natives; nor have they forgotten its properties now, for it is soft and insinuating, and of especial use in removing any tightness of the chest. This oil is extracted from the balls by heat; it starts forth in a manner to create admiration, leaving me nought to compare it unto. The oil, too, is drunk mixed with *cocoa*, and,

indeed, it softens any other medicine, however hard its quality. It is also of great service in stopping hæmorrhages of the lungs, for which purpose it is taken internally. Nor is this all, for admirable are the virtues of the Usquahuitl. When coagulated it is so strong, that a breast-plate made of it no arrow will pass. Kings and nobles were anciently accustomed to cause it to be made into shoes, and with these they equipped their fools and jesters, that so the poor creatures might make them sport; for they could not step without falling, which, by their awkward gestures, gave rise to much merriment. The Spaniards, profiting by what they heard concerning the virtues of the gum, used it in waxing their cloaks, which were made of coarse canvass, thus causing them to resist water; and, in truth, it is of great effect in resisting water, but not so the sun, for the rays thereof melt it*."

It will be interesting to pursue the subject of trees a little further, for the purpose of considering how remarkably some species of forest-trees seem restricted to certain portions of the globe. This is very obvious in the Palmetto, or Cabbage-tree (*Areca oleracea*), which is found in the West Indies, throughout the southern regions of the United States, as far north as Cape Hatteras. It rises to the height of one hundred and forty or fifty feet, and is crowned with a regular and tufted summit. This beautiful and majestic tree is often destroyed for the sake of the white, compact, and tender substance that forms the base of the yet unfolded bunch of leaves, and which, when eaten

* *Monarqui Indiana*, Madrid, 1723.

with oil and vinegar, resembles the artichoke or cabbage. The wood, though extremely porous, is invaluable for building wharfs, as the sea-worm, which often penetrates the firmest oak, never attacks the timber of the cabbage-tree; but when exposed to the ebbing and flowing of the tide, it decays as speedily as other wood. This noble tree formerly extended over a vast range of country, but is now rapidly disappearing, and most probably the time is not far distant when it will cease to exist within the boundaries of the United States.



THE CABBAGE TREE.

The Acacia or Locust-tree (*Robinia, pseudo-acacia*), is confined on the eastern side of North America, to that part of Pennsylvania which lies between Lancaster and Harrisburg; while on the western side of the Alleghany mountains, it is found two or three degrees further to the north, and abounds in all the valleys of their extensive ranges. Varying according to the nature of the soil and climate, it rises in Virginia and Kentucky to a commanding height, towering above the forest-trees, to an elevation of seventy or eighty feet, while in other parts less favourable to its growth, it rarely exceeds half that size.

This graceful tree was the first that reached Europe from America. We owe its introduction to Robin, a French botanist, from whom it derived the name *Robinia*; he brought it from Canada, and cultivated it in France, during the reign of Henry IV., since which time it has spread to a great extent throughout Germany and Britain. The foliage is extremely light and graceful, and the pendent bunches of white flowers are equally fragrant and beautiful. These bunches, scattered in gay profusion amid the lively green leaves, render the Acacia peculiarly adapted for landscape gardening.

In the progress of years, the light and elegant acacia loses much of that peculiar gracefulness which characterized its youth. The branches wave no longer lightly in the summer breeze, and the smooth and polished stem is covered with a thick and deeply-furrowed bark, mantled not unfrequently with gray lichens and pendent ferns. When seen in this condition, its appearance is extremely vene-

rable ; it stands amid the saplings of the forest, like an aged and hoary tree over which long centuries have passed. The wood is strong, and rather brittle ; and being of a yellow colour, varied with rich brown veins, and susceptible of a fine polish, it is well adapted for articles of furniture. But its most valuable property is that of resisting the effects of weather, and hence it is much prized. Gilpin relates, that a farmer in Long Island planted a field of fourteen acres with Acacia suckers, at the period of his marriage, as a portion for his children. The eldest son married at twenty-two years of age, on which occasion his father cut down acacias to the value of three hundred pounds, and gave them to the young man to purchase a settlement in Lancaster county. He likewise presented the same sum to his daughter, about three years after, and thus provided for his family without impoverishing his Acacia wood, which speedily repaired the loss it had sustained.

The rapid growth of this valuable tree induced many others to follow the example of the farmer ; and about the beginning of the present century, large plantations were seen in almost every part of the United States. But these did not generally succeed, for the trunks were speedily attacked by a little insect ; simultaneously, too, for in one and the same year the mischief commenced, and large trees were soon destroyed. The insect ate its way into the wood, and pierced it in all directions. Hence the farmers of America relinquished the practice of planting Acacias, and relied on those of native growth ; for the ravages of the insect did not extend to such as grew naturally in the woods.



THE ACACIA.

This graceful tree belongs to a distinct family from that of the Egyptian species which bears the name of Acacia. A similarity, however, subsists between them, and it has in consequence been called *pseudo* or False Acacia. Two of the most ancient specimens might lately be seen in London; one in Old Palace-yard, Westminster, the other in front of Russell House.

We may also notice the Calabash tree (*Crescentia cujele*), as affording another instance of peculiar locality. It is a native of the West Indies, and

central America, and derives its botanical name from Pietro Crescentio, who most probably first introduced it into Europe. This valuable tree bears a beautifully-variegated flower of red and yellow. The oval or bottle-shaped fruit encloses a thin and almost woody shell, which, when stripped of its external skin, and emptied of its juice, is used for various domestic purposes, such as water-cans and goblets, coffee-cups and spoons, and even for kettles to boil water in; the shell being so hard and close-grained as to bear the fire several times without injury. It is occasionally highly polished, and engraved and tinged with indigo and various colours. Rutherford informs us that the calabash is the only vessel possessed by the natives of New Zealand, and that the pulp which it contains is esteemed a valuable remedy in several external and internal disorders.

Another instance may be adduced of remarkable assignment to certain districts, in the Sugar Maple, the *Acer saccharinum* of Linnæus, which grows profusely in all the western countries of the middle states of the American Union. Few trees are more pleasing to the sight. They are generally seen in company with the Beech and Hemlock, the White and Water Ash, the Cucumber and Linden, the Aspen, Butter-nut, and Wild Cherry-trees, though found occasionally in noble groups extending over several acres. Beautiful they are; no blossoming tree can vie with them, for they rise high and put forth their pure white blossoms in the spring before they show a single leaf. They stand like beacons in the forest, indicating the richest soil and abundance of fresh water. Even the

smallest branches are so impregnated with sugar, that both flocks and herds, with powerful horses, belonging to the first settlers, have been supported on them during winter. The wood is extremely inflammable, and its ashes afford a quantity of potash unequalled by those of any forest-tree.

Men have learned to appropriate the sap which plentifully exudes from out the sugar maple. They perhaps acquired knowledge of its virtues from a small woodpecker which makes an incision in the branches, and feeds upon the nectareous juices. Trees are thus often perforated in an hundred places, and the more frequent the incision, the sweeter is the juice. It is easy to discover those which the woodpecker has tapped, for the juice distils upon the ground, and they become of a dark colour. Twenty-three gallons and one quart of sap have been procured in a single day and night, from one of these dark-coloured trees, from which four pounds and thirteen ounces of excellent sugar were obtained. They are not injured by the process, but the oftener they are tapped, the sweeter and more copious is the juice. A maple has not only survived, but flourished after forty-two incisions made in the same number of years. Even such as have been cut down during the winter, for the support of domestic animals, yield a considerable quantity of sap, when they begin to feel the rays of the sun. Those who travel in the forests are often struck by the singular appearance of spouts made from the sumach or alder, projecting several inches beyond the trunk of stately trees; while, beneath them, clean white troughs are placed to receive the juice as it distils. This

continues from four to six weeks, according to the heat of the weather, and is conveyed every day to a large receiver ; from which it is carried, after being strained, to the boiler.



THE SUGAR MAPLE, (*Acer saccharinum*.)

The distribution of plants is extremely curious, but it cannot be accounted for by the influence of climate, or of temperature ; for it happens not unfrequently that similar climates exist in different portions of the globe, without identity of productions. The climate of the temperate zone is analogous to that of the high mountains in the torrid zone, but no in-

digenous rose-tree has been discovered in South America ; nor, as yet, in the southern hemisphere. The heath, too, is wanting, that beautiful genus, which often spreads like a purple light upon the mountains, and over the commons of this country ; and as the heath is unknown in the New World, so is the mimosa, as a wild plant, throughout Europe. Its delicate and airy foliage is never seen to wave even in sunny Italy, unless fostered by art : and among the mysteries of nature, which set all human conjecture at defiance, is the extraordinary fact that mimosas grow best in North America, where also a greater variety and luxuriance of vegetation is observable than in the most temperate parts of Europe, notwithstanding a greater severity of climate. Species of the pine and elm, the beech and oak, are found in America, but they differ from the Asiatic and European species. The lofty mountains of the New World are adorned with plantains and valerians, with ranunculuses, arenarias, and medlars, and with trees and shrubs to which travellers have given European names, in consequence of an obvious similarity ; but they are all specifically different.

Returning, now, to the subject of animals, we proceed to speak of the Marsupiata, or pouched animals, a distinct class in the arrangement of Baron Cuvier's *Animal Kingdom*, supposed till lately to be restricted to the continent of America, though now presumed to inhabit several other portions of the globe. Concerning them, we may briefly notice, that the American Didelphes are nocturnal, that they live in trees, and subsist on insects, birds, and fruit ; that the Dasyuri inhabit New

Holland, where they occasionally visit, though unwelcome guests, the houses of the natives; and that the *Perametes* also affect Australasia, where they form burrows in the earth, and run with incredible celerity. These three divisions represent, in the New World, the insectivorous animals with long teeth, such as the tenrecs and moles, which are common in other parts.



THE PHALANGER.

The Phalangers, properly so called, reside on trees, where they seek for fruit and insects. When they see a man, they immediately suspend themselves by

the tail, and it is possible to make them fall through weariness, by continuing to look at them for some time. They generally inhabit the Moluccas, as well as America, but the flying phalanger, the *Didelphis petaurus*, is peculiar to New Holland.

The Kanguroo Rat, (*Macropus minor*, of Shaw,) resembles his giant relative, the kanguroo, both in form and habit, and differs only by having his canine teeth in the upper jaw. He principally inhabits the wildest parts of New Holland, and prefers those deeply-wooded banks which are covered with berry-bearing trees, and to which innumerable insects resort for shelter during the heat of summer. Among these, he is often seen springing in quest of prey; his mouse-coloured coat harmonizing with the gray lichen-dotted rocks, and his short fore-paws held up either to pluck the ripe fruit, or to seize some gaily-coloured insect, as it sports from bush to bush. He is an innocent and playful creature, and may be easily domesticated.

None of the animal kingdom are, perhaps, equally eccentric in their appearance with the kanguroo. The irregularity of their limbs is so remarkable, that they walk on all fours with difficulty, but then they can bound with astonishing celerity, by the aid of their hind feet, while the large nail in the middle of each foot, which resembles a wooden shoe, serves as a weapon of defence.

Cuvier notices several distinct species. The elegant kanguroo (*K. fasciatus*), of the Island of St. Pierre; that of Aroe, near Banda, (*K. brunii*); the gigantic (*K. labiatus*), at least six feet high, living in troops, and headed by a chief; with a new

species, recently discovered on Bathurst Plains, of which the hair is thick and woolly,—are some of the most conspicuous.

The gigantic kangaroo is hunted for his flesh and fur, by the natives and settlers of New Holland; but if there be a pond or river within reach, he hastens thither immediately, as the only place in which he can successfully give battle to the dogs. Here, then, he stations himself, and from the great length of his hind legs, he is enabled to stand securely on firm ground, while the dogs are obliged to keep swimming; and nothing can be more ridiculous, than the spectacle they afford. The kangaroo stands gravely erect, with his fore-paws spread out before him, wheeling round and round to ward off his assailants. If one approaches within reach, he pounces his paw upon him, and holds him beneath the water, gazing round at the same time, with the most solemn sim-pleton aspect, paying no regard to the kicking of his victim, who must inevitably perish, unless some courageous colleague hastens to his assistance, and constrains the merciless kangaroo to let go his hold. Should this occur, the liberated captive is seen paddling the next moment with all his might towards the shore, looking most piteously, with no inclination to venture a second time, notwithstanding the cheering of the hunters.

Future naturalists may, probably, afford some additional particulars respecting the general habits of the kangaroo: at present we only know that they are inoffensive, and easily domesticated, though concealing beneath their innocently expressive countenances, a love of mischief which is occasionally

inconvenient. One in the possession of Sir John Jameson, used to slip into the dining-parlour, whenever the door was a-jar, and gravely take his station behind his master's chair, or that of a guest, giving the individual whom he thus honoured, an admonitory kick every now and then, if he failed to help him when requested.

Persons who have been accustomed to observe the wonderful adaptation of birds and animals to the sites they occupy, would readily assign the kangaroo to an open and champaign, or to an hilly and unwooded country, where he could bound at will. For the creature rather leaps than runs, and would consequently require a free and open path-way. Squirrels, on the contrary, are generally found in woods; they bound from branch to branch, and run nimbly up the smooth and slippery trunks of lofty trees. The forests are their home, and they often travel on the branches over a great extent of country without descending to the ground. Moles and armadilloes burrow in the earth; the one is found in meadows where the ground is easily excavated; the other on sandy plains, where no resistance is presented to their subterraneous labours. These are a few among innumerable instances of remarkable assignment to different localities; others, which might be traced in our daily walks, would surely furnish many interesting subjects for thought and conversation, were we accustomed to observe attentively the objects by which we are surrounded.

We are unacquainted with any particulars relative to the general habits of the *Phaseolomys* and the *Koola*, excepting that the first is clumsy in her

make, and lives on grass; and that the second passes the greatest portion of her time on trees, or in such burrows as she excavates, and that she is remarkably careful of her young. This quality is obvious in most animals, in the female especially, who will rather die than suffer her offspring to be injured; yet the exhibition of it varies in different species, according to their construction and mode of



THE KOOLA.

life. The Koola places her little one upon her back, and instructs it to hold fast; the Monkey carries her bantling in her arms; the Colugo carefully enfolds it in the membrane which is fixed like a mantle to her neck and arms; graminivorous animals place their young on the soft grass, and watch beside them; the carnivora carefully conceal theirs in caverns, or hollow trees; the Field-mouse con-

structs a simple nest for the reception of her offspring; this she often places in a thistle, or hangs it between tall ears of corn; the Armadillo excavates a subterraneous habitation, where she brings up her family. But the pouched animals are rarely separated from their young; they are provided with a skin on the under surface of their bodies, resembling that which is attached to the pelican,—a kind of loose waistcoat, with an opening. In this, as a place of retreat and concealment, the young ones take refuge, and are safe. Presuming that Opossums inhabit an open or woody country, the reason for this extraordinary appendage may be readily explained: without it the young would have no chance of escaping when pursued by the hunter; but with it they are secure, and the bounding leaps which carry the mother beyond the reach of danger, carry them also. It is their cradle, their asylum, and the machine for their conveyance; nor is it a mere doubling of the skin, but it is a new organ, furnished with bones and muscles of its own; the one to support and give a fixture to the muscles, the other to shut or close the opening of the cradle, according to the inclination of the animal, or the wishes of her young. Thus, at one time, an Opossum may be seen bounding over the dewy herbage alone, and apparently thinking only of enjoyment, but in one moment she is encompassed with her family; the looker-on may wonder whence they came, but suddenly some sound is heard, as if danger was at hand, the little ones disappear, and she is gone.

Another peculiarity is obvious in the American Opossum; this is, the having a long muscular

tail, which answers the purpose of a hand, and is invaluable to creatures which frequently inhabit extensive and lofty forests. They are thus enabled to ascend the smooth and slippery trunks of trees when burdened with their young, and to run with incredible celerity along the branches. This peculiarity is not found in the Australian Opossum, because unnecessary, and nothing is bestowed in vain. Other animals also inhabit the thickly-wooded districts of South America, and are provided in like manner with this important member; these are a numerous tribe of monkeys, the ant-eaters, the kinkajous, and the prehensile porcupine. We observe in this a striking instance of adaptation to localities.

“It has always been my habit,” says an elegant natural historian of New York, “to embrace every opportunity of increasing my knowledge by actual observation, and I have ever found ample means of gratifying this disposition wherever Providence has cast my lot. When an inhabitant of the country, it was sufficient to go a few steps from the door to find myself in the midst of numerous interesting objects; when a resident of the crowded city, a healthful walk of half an hour placed me where my favourite enjoyment was offered in abundance; and now, when no longer able to seek in fields and woods for that knowledge which cannot readily be obtained elsewhere, the recollection of my former rambles is productive of a satisfaction which past pleasures rarely bestow.”

One of the naturalist's favourite walks lay

through a narrow lane, about a quarter of a mile long, and not much wider than a street, being closely fenced on either side; noble trees drooped their branches above the banks, and wild flowers crept up the sides. It was a lovely spot; the precincts, indeed, were narrow, but there the lover of Nature found ample employment for his leisure hours. On entering the lane he observed a gentle elevation of the turf beneath the fence, which proved on examination to be a regularly-arched gallery, or subterraneous road, along which the inhabitants could securely travel at all hours, without fear or molestation. The sides and bottom of the arched way were smooth and clear, as if much used, and were also strengthened by the roots of grass, intermixed with clay; at intervals a side-path turned into the neighbouring fields, which had apparently been opened for the purpose of procuring food; and occasionally a little gallery was seen diverging from the main route beneath the fence, and finally opening on the grass, as if the inmate had come out in the morning to breathe the sweet fresh air, or to lap the dew which lay like gems upon the sod. Further on, and near the top of a high bank, which prevented the pathway from continuing near the fence, appeared another evidence of the industry of the yet unknown miner. Half-a-dozen hillocks of fine earth were thrown up at irregular distances, and communicated with the main gallery by side-passages. On carefully opening one of these, it appeared to differ little from the common gallery in size, but it was difficult to ascertain the origin of the loose earth. The further progress of the natu-

ralist was now interrupted by a brook, which sparkled across the road over a clear sandy bed, and here too the labours of the little miner had been stopped in that direction; but then he turned aside, and his galleries might be traced into the fields at a moderate distance from the stream. The naturalist still continued his investigation, intending, if possible, to discover the animal whose labours had excited his curiosity; but as he approached the brink of the rivulet something suddenly retreated towards the grass, and seemed to vanish almost instantaneously. While carefully examining the spot from which the creature had disappeared, another gallery, or burrow, attracted notice, though small, and differently constructed. It was formed in the grass, and vain would have been the attempt to follow all its windings, as it opened in various directions, and ran irregularly into the field and towards the brook. This clearly belonged to a family of different habits from the owner of the subterraneous passage. The naturalist did not at this time follow up his inquiries, but, a few mornings after, he again resumed his favourite pursuit, and set forth at that early hour—

When every quivering bent and blade
Stoops bowing with a diamond drop.

The green lane looked still more inviting; a soft breeze gently shook the branches of the trees that drooped above it, beautiful blossoms opened to the sun, and gay-coated insects flew humming in and out of the grassy banks. No particular change was perceptible in the work of the industrious miner,

excepting that any breach had been carefully repaired. It was obvious that when accidents occurred, the inmate had dug downwards, for the evident purpose of raising sufficient earth to fill up the openings; and this, of course, slightly altered the direction of the arched way. On breaking down a part of the gallery, a beautiful cell became visible, which had been excavated in tough clay, and was deeper than the common level. This little apartment was clear and smooth, as if much used; it was also nicely arched, and about the size of a common melon. Thus cruelly disturbed, the owner was soon obliged to excavate another dwelling, rather further on one side. This was also broken up, and again replaced in the course of a few hours; but, being disturbed a third time, it was entirely abandoned. The naturalist now trod down the gallery for the space of some inches, and waited beside the ruin, to discover, if possible, the persevering inmate. A few minutes passed, and his wishes were realized; the flattened gallery was quickly raised to its former convexity, and the inmate seemed to be busily occupied within. No time was to be lost; and with a careful thrust of his knife beneath the rising earth, he threw forth his prize into the sunshine. For a moment the captive seemed motionless with astonishment; "and vain would it be for me," said the narrator, "to describe my pleasure in having thus succeeded. I was delighted with the beauty of the fur, with the admirable adaptation of his diggers, or broad rose-tinted paws, to the miner's toil; with the strength of his limbs, and the peculiar suitability of his head and neck to the kind of life for

which he was designed. He was the Gerbil of Canada, the *Mus Canadensis*, or Canadian mouse, a curious little creature which feeds on earth-worms, and whose eyes seem of little use in the broad daylight."

The next visit of the naturalist to his old hunting-ground, the lane and brook, was during hay-harvest, when the green grass in the meadow was rapidly sinking before the keen-edged scythes of the mowers. This circumstance afforded him much pleasure, for it promised a freer scope for his rambles, and might also enable him to ascertain various particulars concerning which his curiosity had been raised. This was especially the case with regard to the neat furrow in the turf that first excited his attention; for as the scythes swept nimbly through the long grass, they exposed several nests of the field-mice, the occupants of which, by means of these grass-covered alleys, passed unobserved by their enemies, the hawks and owls, when in quest of either food or water. These nests were very numerous; they were beautifully lined with soft materials, and usually placed in some hollow, or at the root of a strong tuft of grass; which tuft, either by its roots or grain, furnished the family with nutritious food, and if they were numerous, their depredations were made known by the brown and withered appearance of the grass. But, in general, hawks and owls, domestic cats, crows, and weasels, prevent their increasing in such numbers as to be injurious.

Various species were observed in the same green meadow, and the naturalist had just remarked

another and still smaller covered way, when his attention was excited by loud shouts and laughter, accompanied with a general running and scrambling of the people, as if some sport was going on. He soon found that the object of pursuit was a jumping mouse, whose agility afforded a most amusing spectacle. When closely pressed, he ran rapidly, as if seeking to conceal himself; but in a moment he was seen vaulting into the air, and skimming along for ten or twelve feet, more like a bird than a little quadruped. After continuing for some time, and almost wearying his pursuers with running and falling one over the other, the sprightly creature was killed accidentally in one of his beautiful leaps. As the mowers saw nothing worthy of attention in the dead body of the animal, they willingly resigned it to the naturalist, who retreated beneath the shade of a willow to consider its elegant proportions. The general appearance was mouse-like, but the length and slenderness of the body, the shortness of the fore, and disproportionate length of the hind limbs, together with a peculiar tail, all indicated its adaptation for bounding leaps. The sight of this creature, thus formed to vault through the air, strongly reminded him of the great New Holland kangaroo.

We know that these little animals feed on roots, and on the seeds of vegetables, and that they frequent the meadows, to make their nests among the long grass, which is to them a forest. But how, it may be asked, can such feeble creatures brave the severity of a Transatlantic winter, when vegetation is at rest, and snow lies deep upon the ground. Here we have again occasion to observe the care of

Him who called them into being. He has endowed them with a kind of prescience, and when yellow autumnal leaves, hung out like signals on every tree, announce the approach of winter, they hasten beneath the earth, and pass whole months in a state of complete repose. Each mouse digs to the depth of about six or eight inches into the soil, and forms a little globular cell, rather larger than himself, for a storehouse of fine grass. Having thrust in a sufficient quantity to form a comfortable bed, he coils himself into a ball, and in this state he may be rolled across a floor without injury. Thus comfortably housed, the little jumping mouse sleeps securely through the heaviest storms, unmoved by the howling of the wind, or the pitiless driving of the rain; he requires neither food nor fuel, he rests securely till the winter is past and gone.

Another covered way had attracted the notice of our naturalist; it was excavated by the smallest of all quadrupeds, the minute shrew, which, even when full grown, rarely exceeds thirty-six grains. He had seen a living specimen, and once traced a burrow nearly round a large barn; opening it all the way, and even creeping beneath the floor till he discovered its termination under a foundation stone, but the stone could not be moved by a single arm. Most probably a household of mice were safely nested there, and we may conjecture that they rejoiced not a little in the security of their habitation.

The Canadian Porcupine (*Hystrix dorsata*) is not invested with such long and large quills as the

European species, but his back is thickly set with spines, which are more than two inches and a half in length, and form a sufficient protection against every enemy but man. Being unable to escape by flight, the Porcupine has recourse to various expedients when danger presses, and trusting, it would seem, in the prickly coat by which he



THE CANADIAN PORCUPINE, (*Hystrix dorsata*.)

is defended, he places his head between his legs, folds himself into a ball, and erects his pointed spines, against which the cunning of the fox, the fury of the wolf, and the persevering attacks of the domestic dog, are alike unavailing. At every attempt to bite, the nose and mouth of the aggressor are severely wounded, and if he rashly renews the attack, death is often the consequence of his teme-

rity, from inflammation occasioned by the adhering prickles. The quills, when highly magnified, appear to be barbed at the tip with numerous small reversed points, and are so slightly attached to the skin, as to be easily thrown off. The animal will even, when offended, brush against the legs of those who disturb him, and leave many of his spines adhering to the skin. The above sketch is that of a female, which Major Smith drew when in Canada. While the Major was thus employed, she stuck several of her quills into the hand of a man who unwisely attempted to caress her. She appeared fearless, and walked round him several times, as if disposed for further acquaintance, till watching an opportunity, as he stooped to admire her, she suddenly brushed herself against his hand, which produced a few drops of blood, with many ejaculations.

This animal abounds in the country of Hudson's Bay, in Canada, and New England, in some parts of the Western States, and throughout those uncultivated regions which extend between the Rocky Mountains and the great western rivers. He is still occasionally found in remote and unsettled parts of Pennsylvania, but to the southward of that state he is entirely unknown. The species pass a considerable portion of their time in sleep, and are apparently both solitary and sluggish; they feed on the bark and buds of trees during the winter season, but in summer principally on wild fruits. Dr. Best, of Lexington, observed, that when the snow was on the ground they generally remained in hollow trees; he traced their footsteps on the snow, and found that they travelled from their dwelling to the

nearest ash-tree, the leaves of which served them for food. In every instance that came under his observation, there was no single track, but a plain beaten path from the hollow tree in which they lodged to the favourite ash on which they fed. The naturalist having had two fine trees cut down in order to ascertain the actual fact of their domiciliation, found a porcupine in each, and in one of them four racoons, but though such near neighbours, they did not interfere, for the racoons occupied the trunk, and the porcupines the branches. Yet, though numerous in many parts, they seem to have little intercourse. They prefer to live alone, and it is rare to see more than one in the same place; neither are they fond of change, nor prone to wander from one extremity of the forest to another.

Indians who go as couriers from fort to fort often see them in the trees, and should they not wish to capture them at the time, they travel on, and may not return for a week or ten days; yet they are sure to find them on coming back, if not on the same spot, yet within the distance of a mile.

The flesh of this animal is so much esteemed by the Indians, that they think it the greatest luxury their country affords. The quills, too, are in great request, and the patience and ingenuity displayed by Indian women in ornamenting with them various articles of dress, as well as boxes, and work-bags, cannot be appreciated by those who have never seen any of the articles thus adorned. The quills rarely exceed two inches and a half, or at most three inches in length, and are not larger in circumference than a wheat-straw; yet with these, when dyed of various

rich, and permanent colours, both skins and the bark of trees are embroidered in the most elegant manner. In making this embroidery Indian women have not the advantage of a needle: they bore a hole in the skin or bark with an awl, and pass through it the sinews of a deer, or of some other animal, and at every stitch they wrap the thread round a porcupine's quill; when the quill is nearly covered, its end is turned into the skin, or concealed in such a manner as to present a beautiful and perfect piece of workmanship. In some specimens of the art, the ornaments are wrought exclusively with undyed porcupine quills, but, in general, a strong contrast of bright colours is preferred. Animal figures are also occasionally exhibited, and these are formed by embroidering with quills. The Philadelphian Museum, rich in objects of natural curiosity, also possesses a splendid and valuable collection of articles of dress, and implements of peace and war, peculiar to the aborigines of America, showing the extent to which porcupine quills are used by that interesting people, as well as affording some idea of the number of those animals that once abounded in the Trans-Mississippian regions.

With regard to the Prehensile Tailed Porcupine (*Hyst. prehensilis*), we may observe, that the habits of an animal are generally made known by its make and organs. The prehensile tail which nature has assigned to this species, clearly indicates that he lives on trees. We find accordingly that the couendou, to use the Indian name, is in fact a tenant of the forest, that he climbs with facility by means of his claws, and avails himself of the holding powers of

his tail when descending. His food is also found in the forest, and this consists of fruit, leaves and flowers, which he cuts with ease by means of his long incisors.

The Lemming of Hudson's Bay (*Lemmus Hudsonius*), resembles, in his habits and mode of life, his relatives of the Antarctic regions. Like them the species congregate in myriads, and march straight forwards in regular lines, about three feet asunder, and generally in a south-east direction. If a river flows before them, they swim across; if a mountain obstructs their way, they go round or climb over it. Even fires, when kindled to guard the corn-fields in their southern progress do not alarm them. On they go in spite of every obstacle, journeying chiefly in the night, and devouring every root and vegetable, fruit, or grain. Happy is it for mankind that such migrations are not frequent, and that the herds are uniformly accompanied by foxes and weasels, which destroy great numbers. The most disastrous consequences would otherwise ensue in every country through which they pass.

Let us now for awhile contemplate the cold and cheerless regions which these animals frequent. A land, towards the north, of giant mountains, covered at intervals with blighted shrubs and a scanty garniture of moss; of unpeopled valleys filled with stunted pine and fir, with birch and juniper; and of lakes formed by the melting of ice and snow, so cold and destitute of even insect life, that only a few trout inhabit them. The surface of the earth is everywhere uneven, and is

covered in many parts with stones of amazing size. Fierce winds, blowing for at least three quarters of the year, occasion a degree of cold, unfelt in any other portion of the globe; and during winter it is so intense, that the snow which begins to fall in October, and continues falling at intervals through the winter, descends not as with us in gentle flakes, but like the finest sand. Those who have the courage to winter in this inhospitable clime, often find on waking that the blankets are covered with hoar-frost from their congealed breath, and that the bed-clothes are frozen to the wall. While the earth is thus frost-bound, and covered with snow as with a shroud, the heavens are gloriously adorned. Mock suns and halos exhibit the colours of the rainbow, and the aurora borealis spreads its dancing lights across the vast concavity. The moon, too, shines with a splendour unknown in more temperate portions of the earth, and the stars are of a fiery redness. Even in such parts as are comparatively mild, the cold is still severe, and were it not for the extensive forests of trees yielding berries, that extend for miles, no living creature could exist. But these forests are inhabited by a variety of animals and birds, who find in them both food and shelter. They are clothed in the warmest fur, or have down beneath their feathers; and however rich or varied may be their tints during the summer months, they uniformly assume the livery of winter throughout that rigorous season, when every thing both animate and inanimate is white. Nor is this singular phenomenon confined to the native animals of the country; even dogs and cats brought from England to

Labrador, or the neighbourhood of Hudson's Bay, become white at the approach of winter and are invested with softer and thicker fur.

It is highly interesting to trace the progress of vegetation on those mountain-ranges, which exhibit its advances from the regions of perpetual snow, through crustaceous lichens, and green mosses, dwarf pines and firs, brambles and willows, with underwood and flowering shrubs, to those belts of verdure which extend into the valleys. But from the country of Hudson's Bay to Canada, it is exhibited on a grand and majestic scale. He who departs from Labrador, leaves behind sterile rocks, and a country covered with huge stones. By degrees, he sees before him extensive plains, bright with yellow furze, and mountains whose sides are varied with the purple blossoms of the heath. Then stunted pines and beech-trees grow low upon the ground, and then a solitary tree rises in the distance far above them, heralding the approach to woods, which are faintly seen against the horizon. By degrees, the pine and fir assume a bolder character, and as he advances further, he finds himself beneath the shade of lofty pines and giant firs, whose firm branches have withstood the storms of ages. Then comes the light and graceful larch, trembling in every passing breeze, and then the majestic cedar, till at length he sees around him all the grandeur and luxuriance of vegetation in those noble forests which overshadow the uncultivated parts of Canada. These forests, in common with those of the United States, produce the magnificent and stately *Pinus Canadensis*, inclu-

ding three varieties, having narrow and deep-green leaves, and distinguished from each other by the light-brown, or red, or sable hue of their cones. Beside them, often springs the humble *Pinus balsamea*, or Hemlock Fir, and the tall Swamp Pine, in striking contrast to the trembling Maple and the Ash. Far, too, as the eye can reach, extend vast forests of the Larch; that beautiful tree, which artists, from the time of Pliny to that of Raphael, styled the immortal wood, and painted on it their most valuable productions. Who, looking from an eminence into the depths of those vast forests, where the gray and often lichen-tinted trunks of innumerable trees rise like columns, does not observe the exquisite variety afforded by the blue, and white, and red, the crimson, and pale pink, blossoms of different kinds of larch, that appear in mingled beauty on the gently-undulating branches, now quivering in the sunbeam; and now throwing their dancing lights and shadows on the earth? Oaks, too, are there; cedars of stately growth, as ancient, perhaps, and as umbrageous, as those of Lebanon; walnuts, and beech-trees in groups, with elms and poplars, resembling those of Britain; one rising like a pyramid of verdure, the other trembling in every passing breeze. Birds of various kinds delight to harbour among them, and such aged elms as have become hollow during the lapse of years, afford a shelter in November to wild cats and bears, which remain there till April. Indian hunters penetrate far into the forests, not only to seek for game, but also to procure the bark of the red elm, which they sew together with the inner rind, and fix to ribs

made from the boughs of the hardest trees, found which, when pitched and painted, form canoes unrivalled for lightness and durability.

Around the borders of these vast forests grow the cherry and plum, with a tree called Vinegar, as the fruit, when steeped in water, produces a pleasant acid. Clear running streams, which flow murmuring in open places, are often shaded with the elegant Alaco, which bears a sweet and pleasant fruit; and sunny spots are beautifully varied with white blossoming thorns and cotton-trees. The flowers of the one yield abundance of yellow farina to the wandering bee; those of the other, when shaken early in the morning, afford a sweet juice which tastes like honey. Sun-plants, resembling marigolds, also grow to the height of seven or eight feet, and often present their brilliant orbs in striking contrast to the deep foliage of the fir.

To such animals as find a shelter in these forests, or range uncontrolled through the open plains, we owe the materials of some important manufactures; and hence their spoils form considerable articles of commerce. They include both noble herds of deer and elks which pasture on the open plains; bears, and foxes, martens, and wild cats, ferrets, weasels, squirrels, hares, and rabbits, which prefer the covert, or the margin of the forests; wild cattle; also roebucks, goats, and wolves, and among the marshes, otters, musk-rats, and beavers.

The extensive forests of the arctic portions of America are silent during the bright light of noon-day, but towards midnight, when the sun travels near the horizon, and lofty forest-trees cast their lengthened

shadows on the ground, the warbling voices of innumerable birds are heard, while the choristers are themselves unseen, and continue without intermission till six or seven in the morning. The feathered tribes of America are neither silent, nor inharmonious. Many of them are, on the contrary, peculiarly melodious, and the bursting forth of their sweet voices, from amid the perfect stillness of the forest, is inexpressibly affecting.

Beautiful, too, is the transition from the repose and silence of an arctic winter, to the animated bustle of the summer which prevails in the high latitudes of North America. The leafless branches are suddenly re clothed with verdure, beautiful flowers simultaneously open, and every succeeding day welcomes the arrival of feathered songsters to swell the chorus with their plumage as gay and unimpaired as when they gave animation to the deep-green forests of tropical regions. Hard must be the heart of that man, and callous to the best feelings of our nature, who can contemplate unmoved the exhilarating scene, who can look upon the opening leaves and glorious flowers, and listen to the joyous song of innumerable birds, without lifting up his heart in gratitude to Him who created and sustains the wonders by which he is surrounded. "The most verdant lawns and cultivated glades of Europe," justly observe the authors of *Fauni Boreali Americani*, "fail in producing that exhilaration, and buoyancy of mind, which we have experienced in treading the wilds of Arctic America, when their snowy covering has been replaced by an infant, but vigorous, vegetation. It is impossible for a traveller

to refrain at such moments from joining his aspirations to the song which every creature around is pouring forth to the Great Creator."

The vast solitudes of those far-distant regions, where man has not fixed his abode, are generally overshadowed with dense forests, which during many ages have successively flourished and decayed. These impart to the mighty landscape a character of grand though sombre uniformity, broken only by the course of rivers, the ruggedness and sterility of rock and soil, or where the furious hurricane has thrown down majestic trees with a violence proportioned to their resistance. The traveller who, impelled by curiosity, advances beyond the "father of the western rivers," finds himself gradually emerging from these apparently interminable shades, and entering upon a new world. Before him extend fields of the richest verdure, interspersed with clumps of light and graceful trees, in the fashion of a park, with the distant windings of the river, fringed, far as the eye can reach, with cotton wood and willows. After traversing these delightful solitudes, enlivened by numerous herds of browsing animals, and arriving at the higher and more barren portions of the tract, he is often startled by a shrill whistle, which sounds to him as the signal of a lurking Indian. But on advancing further, the innocent cause of alarm is found to be a little quadruped, the Prairie Marmot, whose dwelling-place is indicated by small mounds of earth, near which he sits erect in an attitude of profound attention. Similar mounds are seen in various directions, extending over many acres, and the whole forms one large village, con-

taining perhaps a thousand inhabitants, whose various gambols delight the traveller as he passes.

Smaller villages are also seen, and some of greater extent; but on the borders of the Rocky Mountains, where no human footsteps encroach on their ancient empire, unless by chance a traveller may pass that way, they extend even for miles. Each burrow contains several occupants, and seven or eight are often seen reposing on one mound. Here, in pleasant weather, they delight to bask in the warm sunbeams. When danger approaches, they bark defiance, and intrepidly flourish their tails; when it draws near, the whole troop hasten into their subterraneous habitations, where they remain till the danger is past. They then peep forth one by one, and vigilantly scrutinize every object before they resume their wonted stations.

These conical mounds, which make known the habitation of the Prairie Marmot, are about six or eight inches above the surface, and two or three feet in circumference; a passage descends vertically from them to the depth of two or three feet, and then goes off in an oblique direction downwards. Each contains a neat globular cell of fine dry grass, with an aperture at the top, large enough to admit a finger, and so compactly formed, that it may be rolled about without receiving any injury.

Marmot villages are also very common in the Prairies of the Platte. Captain Head and his companions observed several during their progress towards the Rocky Mountains: the further they advanced, the more frequent and extensive these villages became, and it was highly interesting to contrast

the stupendous elevation of the mountains with the humble mounds cast up by these enterprising little animals. Many of the barrows presented an appearance of considerable antiquity, and were gene-



THE PRAIRIE MARMOT (*Arctomys Ludoviciani.*)

rally overgrown, excepting at the entrance, with that scanty herbage which always marks the area of the Prairie-dog villages. As the food of these wild creatures consists of grass and herbaceous plants, it seems difficult to assign a reason for the preference which they invariably show to sandy and barren places, unless that they may enjoy an unobstructed view of the surrounding country, in order to be seasonably warned of the approach of wolves or other enemies.

Rattle-snakes of a particular species are seen occasionally in these villages. They are found between the Mississippi and the Rocky Mountains, and seem to prefer an unproductive soil, where their sluggish gait may not be retarded by grass or weeds. Some writers attribute to them a voluntary domiciliation with the Prairie-dog, but the most intelligent travellers reject this idea. The rattle-snake, like many other serpents, takes refuge in any convenient hollow, either in a rock or tree, regardless of the rightful owner, but no facts have yet proved that he is an acceptable inmate of the dwelling of the Arctomys.

Yet though the villages of which we speak are numerous in the most barren regions of the Platte, some few are finely situated. Dr. James noticed one, under circumstances of singular and romantic beauty, which extended over an area of about a mile square, having a smooth surface, and sloping almost imperceptibly towards the east, clothed with thick and closely-fed herbage. As our traveller approached the village, its site was covered with a herd of some thousand bisons; on the left appeared a number of wild horses, and immediately in front twenty or thirty antelopes, with as many deer. The sun was near setting, and his beams fell obliquely upon the grass, giving an additional brilliancy to its dark verdure. The little inhabitants of the village were seen running playfully about, and as the strangers approached, they darted to the top of their burrows, and proclaimed their alarm in the customary notes of apprehension. They seemed to know that huge bisons and antelopes, deer and horses could not harm them, but man was a strange

creature amid their pathless solitudes, and they instinctively fled from his approach.

Scenes of this kind are frequent in the wild unvaried plains of the Missouri and Arkansa. Captain Head observed some villages of a similar description among the Andes, the entrances of which were uniformly guarded by two owls, which were never an instant from their post. But why these venerable personages thus tenaciously occupied their station, could only be a matter of conjecture. No traveller has yet determined whether it be to apprise the inhabitants of danger, or perfidiously to prey upon the young, should they incautiously peep forth, unattended by their parents. Most probably the latter, as the inhabitants never venture out except in the evening. Captain Head noticed them as the most serious-looking animals he ever met with; even the young ones were gray-headed, with mustachios, and looked grave and thoughtful, and when they sit on the top of their mounds they seem to be moralizing.

These creatures abound, too, in the extensive prairies of the Mississippi, and beautiful is the scenery that frequently surrounds them. In some parts, far as the eye can reach, the ground presents a series of undulations, covered with fine herbage, on which the astonishing number and good condition of the herbivorous animals clearly indicate its value for purposes of pasturage. In others the dense and verdant foliage of poplars and of elms is contrasted with the bright red of the sandstone cliffs, which rise far above the tallest trees, and disclose here and there masses of snowy whiteness.

Beneath these sandstone cliffs, and through the wide expanse of the vast prairies, flows that stupendous river, which has been already mentioned, and which collects in its progress of more than 3000 miles the waters of a hundred rivers:

To whose dread expanse,
 Continuous depth, and wondrous length of course,
 Our floods are rills. With unabated force,
 In silent dignity they sweep along,
 And traverse realms unknown, and blooming wilds
 And fruitful deserts, worlds of solitude,
 Where the sun smiles and seasons teem in vain,
 Unseen and unenjoy'd. Forsaking these
 O'er peopled plains they fair diffusive flow
 And many a nation feed, and circle safe
 In their soft bosoms many a happy isle.—THOMSON.

The Mississippi is the one great river into which the others pour their tributary waters, and so vast is its extent that he who commences his voyage up the river at New Orleans in the spring, will leave behind him blossoming shrubs and flowers; and out-travelling the progress of the season, he will find the forest-trees that shadow the Ohio just beginning to expand. In returning, too, at Autumn, a beautifully graduated and inverted scale is equally apparent. When the trees at Pittsburgh are bared by the frost, those of Cincinnati will be in the yellow leaf, while at Natchez the orchards appear in their summer livery. The mighty valley through which the Mississippi flows, and to which it lends a name, is equally productive and extensive. The Creator has not poured such a noble river through a barren land. The soil is deep, and capable of the richest culture, and here and there round and rough

masses of granite are conspicuous. The remains, too, of ancient forests are still visible on the upper grounds; but on the lower cities have arisen, and orchards and gardens cover the sites of thickly-matted woods; the axe and spade have also extended to the distant mountains, and log-huts, and cultivated fields are seen beside the sources of these rivers, which swell the torrent of the Mississippi.

Sixty nations once inhabited this splendid valley, but war and intoxication have thinned them. What their ancestors were we know not, yet traces are still found which indicate a superior degree of civilization, and convey the impression that a different race once inhabited the banks of the Mississippi. But those who have been driven from their favourite resorts, into the still unsettled parts, are apparently a melancholy and sullen race. They do not readily sympathize with external nature, and nothing but an overwhelming excitement can arouse them. Their converse with woods and deserts, with the roar of winds and storms, and the gloom and desolation of the wilderness; their seeming banishment from social nature, and the sight of continual encroachments made upon their hunting grounds by men whom they consider as belonging to an inferior race; the dangers, too, by which they are surrounded, and their constant struggles to maintain a precarious existence, all conduce to blunt the finer feelings of their nature and to impress upon their countenances a steady and unalterable gloom. Hence arise the horrors of their dreadful warfare, and the cruelties practised on their captives; the alternations of hope and despair, and

the fury of gratified revenge. Such are the descendants of those vast tribes, to whom once belonged the valley of the Mississippi; but such they were not always, for William Penn thus writes concerning those of the same country:—"In liberality they excel; nothing is too good for a friend,—give them a fine gun or coat, it may pass twenty hands before it stick. Light of heart, strong affections, but soon spent. The most merry creatures that live; feast and dance perpetually, they never have much, nor do they want much; wealth circulates with them like the blood; yet still they possess great national sagacity, and speak on great occasions with much elegance." Such was the Indian of the Mississippi, before oppression and strong liquor changed his character.



SQUIRREL PETAURUS.

There is, perhaps, no class of animals, with which so many pleasing associations are connected as the Squirrel, that glad-hearted and rejoicing creature, which lives on trees, and seems an emblem of sprightliness and innocence. The sight of him recalls to mind the beauty and repose of woodland scenery, the rivulet that leaps sparkling from some broken crag, the trees that droop and bend across the stream, and that wild voice which comes mellowed, as it breaks upon the traveller's ear, from amid innumerable leaves and branches. Such is the Squirrel's favourite haunt, in our own green woods; and such, also, in every part of the known world. Wherever the forest boughs are thick, and the waters flash and sparkle, there is he seen to roam free and unrestrained with his kindred. We have spoken elsewhere of the European species, and now those of the Transatlantic States must detain us a few moments. But who that has not watched and waited, in their own beautiful retreats, may reckon the vast numbers that extend from the remotest boundaries of South America, to the furthest north, or tell them in order by their names? There is the Masked Squirrel and the Black, the Red-bellied, Side-marked, and River, Large-tailed, Flying, Mexican, and Georgian, the *Petaurus*, and *Guerlinquet*, with innumerable others, concerning which no particulars have reached us.

The Gray, or Carolina (*Sciurus cinereus*), differs little, if at all, in his specific character, from his playful relatives of the ancient world. Gay and vivacious, he has all the customs of the common European Squirrel. While running at the utmost

speed, this graceful forester will stop in an instant, and turn and return by the same path, without any apparent cause. When captured, he suffers himself to be handled, without the least resistance, yet he seems to have little individual attachment, and rarely answers to his name, however familiar with the voice that calls him, and, however much of kindness may be associated with that voice. But he well knows the cracking of a nut, and comes readily at the sight of food. He is fond of warmth, and seems to enjoy basking in the sun-beams, as his greatest luxury. When evening draws in, he collects together a bundle of hay or straw, or withered leaves, and then rolling the mass around him, he retires to rest.

We may also briefly notice the Flying Squirrel of America, the *Sciurus volucella* of Linnæus, as affording a striking instance, that instinct, and the small degree of reason which is given to the lower orders of creation, beautifully harmonize with the sphere of action to which they are assigned. In proportion as the young are helpless and susceptible of cold, so the affection and tender care of the parent is increased. Thus we find that in the Carolina Squirrel, the careful mother warms and cherishes her offspring, in the ample folds of the lateral wing, or membrane, with which she is invested. When she leaves her nest, in order to find food for herself and them, she fondly covers her little family with the moss which she has collected. Yet though the Squirrel is generally found in woods, some of this extensive tribe seem placed by their Creator amid sterile and inhospitable scenes, as if mementos

of His power to nourish and sustain the creatures of His hand. A small Squirrel of a dark colour, inclining to brown, with a round head and erect ears, in habits and appearance much resembling the prairie-dogs, and living like them in burrows, under the projection of a rock, was observed by Dr. James and his companions, when ascending towards the highest peak of the Rocky Mountains. They had proceeded beyond the point where the red cedar and the flexile pine disappear, and entered a region of astonishing beauty and great interest, on account of the brilliantly flowering alpine plants with which the soil was covered, and which were, generally, of a rich blue. Far beneath, masses of primeval granite and unscaleable and naked rocks, started forth; and here and there an aged tree, with curved and inflexible branches, proclaimed the storms it had withstood, and the centuries during which it had vegetated. Further still, appeared immense blocks of ice, with innumerable mountains capped with snow; and in some of the more distant, it seemed to extend like a wide-spread mantle, even to their base. Amid such a scene of grandeur and desolation, how cheering was the appearance of beautiful alpine plants, and those little joyous Squirrels; how cheering, too, seemed the instinct which inclined them to watch the travellers' approach, and then to utter their shrill cries, that their companions might hasten home.

A remarkable geographical distribution is obvious in the Squirrel tribe. Its members are spread throughout the north-eastern portions of Europe, the north of Asia and America, and the islands of

the Indian Archipelago; which are equally dissimilar with respect to climate and productions. In Europe, the common Flying Squirrel inhabits the dense and gloomy pine-woods of Poland and Russia, passing its hermit's life in hollow trees, and feeding on cones and nuts, following, too, the range of the vast pine forests that extend throughout the high latitudes of Asia; and it has, till lately, been undistinguished from a nearly allied species found in the northern regions of America. But in the new world, its place is abundantly supplied by three well-known species; first, the Rocky-mountain Flying Squirrel, which often startles the traveller with its bounding leaps; secondly, the Severn River, or greater Flying Squirrel; and, thirdly, the Assepan, which is common in the United States and Canada; in New England also, amid those deeply wooded districts, which so vividly recall to mind the graphic description of the muse of Hemans.

The breaking waves dash'd high, on a stern and rock-bound coast,
 And the woods against a stormy sky, their giant branches
 toss'd,
 And the heavy night hung dark, the hills and waters
 o'er,
 When a band of exiles moor'd their bark, on the wild
 New England shore.

Not as the conqueror comes, they, the true-hearted came,
 Not with the roll of the stirring drum, or the trumpet
 that sings of fame,
 Not as the flying come, in silence and in fear.
 They shook the depths of the forest gloom, with their
 hymns of lofty cheer.

Amidst the storm they sang, and the stars heard, and
the sea,
And the sounding aisles of the dim woods rang to the
anthems of the free.
The ocean eagle soared from his nest by the white
waves' foam,
And the rocking pines of the forest roar'd, this was their
welcome home.

These rocking pines of the forest sounded their wild welcome even to the very verge of the ocean, from which the "pilgrim fathers" landed, and behind them rose a stately company of forest-trees, crowding every hill and dale, whose rear was lost in the far distant wilderness, and which extended over a tract of land wide enough to comprise the parent country, whence the "fathers" came, with all its forests and vast plains, its peopled tracts, and thronged cities. But now wild denuded hills and contiguous arable levels meet the eye of the voyager on first landing; the site of those vast primeval forests, where the larch and pine once reigned in umbrageous majesty, but from which they have entirely disappeared. Even on the southern shores of New England, stumps of the red cedar, and other trees, are frequently dug up, which also refuse to vegetate, and could no more be made to grow there now, than the palm or manchineel. The naturalist knows not how to account for this curious fact, which cannot as yet be solved on natural principles. It cannot be attributed to the prevalence of winds bearing with them saline particles, because those winds always blew; and the ocean has not changed its nature. A poet, perhaps, would tell you, that they soon learned to distrust the pilgrim fathers, whose

welcome they had so loudly sounded, and that when the woodman's axe was heard, the ancient tenants of the soil drooped and withered, or retreated from the sight and sound of strangers, as if they could not endure to see the soil which they had occupied for ages, thus despoiled.

The Squirrel tribe, which is found in every part of North and South America, is associated with the Indian corn or Zea, which equally endures the extremity of cold or of heat. We have noticed that the Squirrel is admirably constructed for the kind of life which it has to lead, and that the colour of its fur changes in cold countries at the approach of winter, while in the sunny portions of the globe, no variation is perceptible: that further, as the animal might experience considerable inconvenience in descending head foremost, after eating, down the trunk of trees, the throat is peculiarly narrow. Equally curious is the construction of the Zea, and its adaptation to the sites which it has to occupy; beautiful, too, is the effect produced by a field of Indian corn, when waving in the summer breeze, and spangled with morning dew. Exquisite is the variety of tints of blue and white, of yellow, red, and green, and speckled, now separated in long ridges, and now mingled by their contiguous growth. No object is more pleasing to the eye, than one of these richly variegated fields, especially when surrounded with a belt of deep dark forest-trees, in striking contrast to the rainbow tints that wave beneath them. And if the whole is beautiful, how curious is the formation of each separate ear, clothed as it is, and armed with strong

husks, that shield it from the heavy rain, by night, and the dew by day, and defend it from the depredation of such birds as live on grain. We may pause for a few moments, to notice the peculiarities of this important vegetable, which growing frequently on windy hills, and exposed to the extreme of cold and heat, requires a singular organization. We would ask of those who believe only what they can understand, why it is that a plant thus circumstanced, is so constructed, while the splendid yellow calyx of the *Cactus grandiflora* holds forth an open goblet to catch the dew of heaven; or even why it is that plants of the same species springing from the same soil, cherished by the same dew, warmed by the same sun, and passed over by the same breeze, should present such a variety of colours; that in one plant the tints are blue, in another red, in a third, crimson, in a fourth, variegated? Here is a phenomenon for the naturalist to solve, for every plant is nourished by its sap, and the sap is a colourless fluid, drawn up from the moisture of the earth.

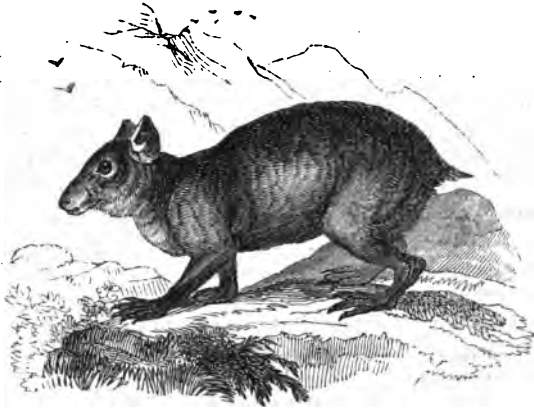
Beavers still abound on either side of the yellow and turbid Mississippi, at that point especially where the quiet waters of the Ohio seem to be swallowed up and lost in its rapid and turbulent current. The forests that shadow it are deep and gloomy, swarming with innumerable mosquitoes, and the banks are overgrown by enormous nettles. The traveller who stands within view of the junction of those magnificent rivers, impressed as they are with the peculiar character of the regions from which they descend, would suppose that he might embrace at one glance

and that vast region between the summit of the Alleghanies and the Rocky Mountains. But such is not the case; his prospect is limited by muddy lands, and the varied sweep of apparently interminable forests. This, then, is the favourite resort of Beavers, and here they pasture in safety, the mosquitoes and the nettles are their natural defenders, the one is to them a guard, the other a bulwark, and here they erect their quiet habitations, governed by laws concerning which we know little, except in their effects. They exhibit order and regularity, well governed houses, and mutual aid and protection. Beavers seem placed by their Creator amid the wildest solitudes of nature, in order to show forth the advantages which naturally result from rule and subordination, from a state of things in which every one knows his place, and where the will of him who rules is the will of those who obey. Little has transpired concerning the interior of their community, for they flourish most in such lone places as are far away from the investigation of enlightened men; but travellers who have seen their villages relate that they work in concert; that while one party cuts down the timber that is necessary for the construction of their houses and the making of their dykes, others carry it away, and lay it in order for another set of workmen who drive in the stakes, and collect the clay which they use instead of mortar. The utmost harmony, too, is said to prevail in each habitation. The master exercises rule, but it is a rule of love, which has for its object the comfort and well-being of every one beneath him. The female knows her place, and rests in quiet con-

science if her mate be present. Both share the labours incumbent on their relative positions; the male, as strongest, labours most, while to his companion is confided the care of their offspring. When spring comes on, they depart for a season to the woods, where they feed on the tender branches of the young green trees, and delight themselves with the abundance that is shed abroad. Beavers might beautifully exhibit to the wandering tribes that inhabit the magnificent solitudes of America, the blessings and security which are attendant on well ordered communities and families. Bees, in like manner, show forth to civilized men the advantages of obedience and rule. One, placed by his Creator amid the grandest and most imposing scenes; the other, stationed in her hive beside the cottage door, present examples, which even the most enlightened would do well to bear in mind.

So work the honey-bees;
 Creatures, that, by a rule in nature, teach
 The art of order to a peopled kingdom.
 They have a queen, and officers of sort;
 Where some, like magistrates, correct at home;
 Others, like merchants, venture trades abroad;
 Others, like soldiers, armed in their stings,
 Make boot upon the summer's velvet buds,
 Which pillage they with merry march bring home
 To the tent royal of their empress,
 Who, busied in her majesty, surveys
 The singing mason building roofs of gold;
 The civil citizens kneading up the honey;
 The poor mechanic porters crowding in
 The heavy burdens at her narrow gate;
 The sad-eyed justice, with his surly hum,
 Delivering o'er to executors pale,
 The lazy yawning drone.—SHAKESPEARE.

The Agouti, which represent in the Antilles, and throughout the warm parts of America, the hares and rabbits of the old world, are remarkably rapid in their movements, particularly on rising ground, though liable to roll over in descending a steep hill, from the extraordinary length of their hind legs. Troops of twenty, and even more, may be seen sporting together in the sunny brakes of the forests of Cayenne.



AGOUTI, OR OLIVE CAVY, (*Cavia aguti*.)

These animals are easily domesticated, but few incline to make favourites of them, as their teeth are sharp, and if disposed to go abroad, they can easily gnaw through the thickest planks. When alarmed by any unusual sound, they stop to listen, and strike the earth with their fore-feet; if irritated,

they utter a shrill cry, and erect their hair in the manner of a cat. Azara even states that, if their fears are unusually excited, they contract their skin with so much force, that the hair has been seen to fall off in handfuls. Nor is this improbable; the quills of the porcupine are equally susceptible, if too suddenly erected.

Independent of the visual organ, which is extremely quick, the senses of the Agouti are generally obtuse, and his faculties seem limited. He is one of those wild foresters whose natural qualities can only be appreciated when at liberty. The moment that makes him a captive, seems to paralyze his natural energy. He becomes almost immovable; eats, if food be offered, but apparently without satisfaction, and neither distinguishes the person who feeds him, nor the hand that supplies his daily wants, nor even the stick which cruelly reminds him of the loss of freedom. It is said that rough treatment cannot irritate, nor kindness soften his natural obduracy.

Five species appertain to this genus, of which the *Cavia Aguti*, and the Patagonian Cavy, are the most conspicuous.

America is the native country of that strange quadruped, the Three-toed Sloth, (*Bradypus tridactylus*), a creature that delights in solitude, and chooses the deepest forest for his home. There he seizes with his enormous claws the branch of some high tree, and hooks himself so firmly that it is difficult to make him let go his hold; when thus attached, he remains hanging, apparently upside down, and describing the figure of an arch. Should any one

wish to capture him, the shortest way is to cut off the branch. But the acquisition is said to be of little worth, for naturalists pronounce him to be invincibly stupid, and, as a companion, insufferably dull; his flesh and fur to be good for nothing, and himself incapable of any kind of sentiment. They also assert that he evinces neither inclination for, nor aversion to, a domestic state, that he is unsusceptible of either joy or gratitude, astonishment or regret, that he presents an image, yet scarcely a living image, of the most perfect apathy. They add, that his plaintive cry inspires melancholy, as it strikes upon the ear in accents of sorrow, and that, were we not acquainted with the dulness of his disposition, we should fancy it a lament over his weak and helpless condition. The native Indians characterize this cry by the vowels *a. i.*, and hence the appellation *Ai*.

But the application of the term Sloth to this, and other of his brethren, is not perfectly correct; the extraordinary slowness of the tribe is not the effect of indolence, but results from their organization, and apparently they are no more able to accelerate their movements, than a hare or stag is inclined to crawl. Nothing can be more cruel than to urge a Sloth onward, for he cannot run. Leaning on one side, he raises a fore-leg, and then puts it down with the most extreme indifference; then, as if fatigued by such an effort, he rests on the side whence the leg was advanced, and in a few moments, pushes the other forward in a similar manner. When this is done, the hinder part of the body follows with equal slowness. It has been calculated, that the *Ai* would employ a whole day in advancing fifty steps;

from which it follows, that supposing him to proceed without interruption, nearly a month must elapse in travelling a single mile.

The nutriment of these quadrupeds consists of the leaves of trees, the branches of which they ascend with considerable difficulty. After devouring every green leaf, they suffer themselves to fall upon the ground, in order to avoid the trouble of descending. This, however, they apparently never resolve to do, unless in actual want. The putting of themselves in motion seems an effort which they would gladly escape, but when the demands of nature become too imperious to be resisted, they roll into a ball, then drop from off the branch to which they clung, and after much consideration, journey heavily along to another tree in quest of leaves. Yet this long abstinence, which lasts occasionally for at least fifteen days, is apparently less the effect of indolence than of that peculiar organization, which makes it difficult to move. It is also asserted that the Sloth seldom, if ever, drinks; and his thick fur forms a kind of mantle which shelters him from the sun.

The second species is the Anau, or Two-Toed Sloth, of Pennant (*B. didactylus*).

Although this animal is very heavy, and his walk vacillating, he is not so slow in his movements as the Ai; yet his pace is seldom quicker than that of a tortoise. Like his brother, the Common Sloth, he inhabits the southern regions of America, through an extent of country from the Brazils to Mexico.

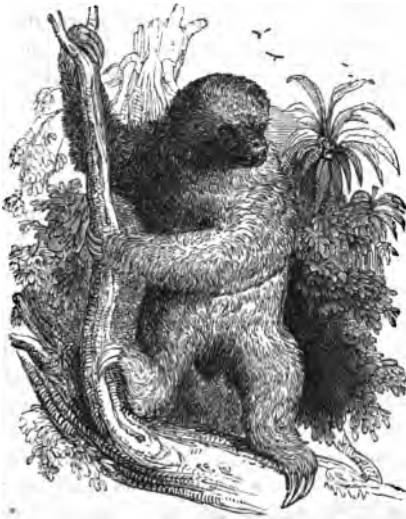
We cannot fathom in various instances the design of Providence with regard to the construction of his

creatures ; nor is it needful that we should. Beautiful is the configuration of the animals by which we are surrounded, and wonderful their adaptation to the wants of man ; others there are, the inhabitants of woods and caverns, concerning which we know comparatively nothing. It becomes us, therefore, to be very careful within the conclusions that we form, lest we should unwarily impugn the goodness of that Mighty Being, whose power is so wonderfully manifested in all that He has made. Some naturalists have erroneously concluded, that the Sloth is necessarily miserable. They judge of others by themselves ; they fancy that an animal which moves slowly, and utters a plaintive cry, must be unhappy, because such would be their case, if placed in a similar condition. They say that weakness and misery are synonymous. But this is a maxim which Milton puts into the mouth of Satan, the great deceiver and enemy of mankind. It is not correct ; for weakness, when taken to signify "not powerful, not potent," as Shakspeare renders it, does not involve misery as its accompaniment. Sloths are deprived, it is true, of all offensive weapons. They have neither power to resist an enemy ; nor speed to fly from him ; nor cunning wherewith to contrive any means of escape. Their senses are said to be too obtuse to apprise them of impending danger ; they cannot climb like the joyous chamois, nor burrow like the marmot, nor bound away with flying footsteps, like the stag. Prisoners in their native wilds, and confined almost exclusively to a few near trees, they are exposed, apparently, to every attack and difficulty. They

seem to us, in some respects, imperfect outlines of organized life, and far removed from the possibility of enjoyment; and were it not from the circumstance of their inhabiting unfrequented regions, remote from the sojourn of man, and where ferocious animals are comparatively few, we should conjecture that their race would soon become extinct. They appear decidedly to be the lowest of the Mammalia, and to form almost a connecting link between that order and the reptile tribe.

These conclusions naturally arise in the minds of those who witness the movements of the Sloth when in a captive state; but they are, in a certain degree, erroneous. They result from the limited views which we are capable of taking, for limited they are; few naturalists have penetrated into the native regions of the Ai, to observe his mode of life. His species are undoubtedly perfect in their kind, and equally capable of enjoyment with the animals that surround them. Had Buffon consulted that authority before which the loftiest pretensions of human intellect must bow, he would have learned that the Deity hateth nothing which He has made, and that consequently no animal has been created only to be miserable; we believe that there is little misery in the animal creation, unless inflicted by the hand of man. To those which the Almighty has especially assigned for our use, and for any abuse of which a severe account will unquestionably be exacted—to those, indeed, unfeeling men have contrived to communicate no small portion of the misery, which they have themselves created. Yet even these poor suffering animals are happier than the

inflictors of their pain; they have no upbraiding consciences, no apprehensions as regards the future; the present is all to them, and it is not always wretched.



THE THREE-TONGED SLOTH.

Such is the subject-matter of the excellent remarks of the humane and enlightened editors of CUVIER'S *Animal Kingdom*; to which we may add, that notwithstanding all the privations under which Sloths are supposed to labour, they cannot be unhappy. Their pleasures, it is true, according to our mode of thinking, can be few or none; but then

the amount of pain must be trifling indeed. This is generally the case throughout the universe. Where the Creator has vouchsafed to any being a peculiar capability for enjoyment, it appears to be accompanied with a proportionate susceptibility of pain. "When," on the contrary, says an ancient writer, "the pent-house of insensibility intercepts the rays of the sun of joy, it is also an adequate protection against the storms of sorrow." Could we look throughout the fair creation we should find the balance even; its great Creator is not less just than wise, less merciful than omnipotent.

We had written thus far, borrowing, as all writers borrow, from those natural historians who often see wild animals only in a captive state, and drawing our conclusions from them, when Waterton's admirable work was put into our hands. In reading it we have found that the naturalists to whom we have referred, if they had observed the Sloth in his native wilds, would have formed more correct opinions. Had they been acquainted with his economy and haunts, they would have learned, that though all other quadrupeds may be described while resting on the ground, the Sloth is an exception.

This animal, then, is designed by his Creator to live on trees, and his habits must be observed in these, his upper element. He is a scarce and solitary creature, and being good food; the hunters never allow him to escape. He inhabits remote and gloomy forests, where snakes sojourn, and where stinging ants and scorpions, with swamps and thorny shrubs and bushes, obstruct the steps of civilized man. . . Were those who are acquainted with his

habits to read the details which have been entered into respecting him, they would probably suspect that none had actually gone into the wilds to examine whether any blunder had been committed in describing this extraordinary creature, which all naturalists have delighted to represent as utterly miserable and forlorn, as ill-constructed, and unfit to enjoy the numerous blessings by which he is surrounded.

Let us now observe him in the depth of those thick and noble forests which extend far and wide, and are rarely penetrated. This, then, is the proper place to go in quest of the Sloth; and by recurring to what has been already said respecting his construction, we shall be able to account for his various movements. His fore-legs, or, more correctly speaking, his arms, are apparently much too long, while his hind-legs are very short, and look as if they could be twisted like a corkscrew; they are evidently incapable of acting in a perpendicular direction, or of supporting him when he begins to walk. Place him on the floor, and he moves with pain, for he has no soles to his feet, and his claws are sharp and long; he is circumstanced exactly as we should be if we endeavoured to rest on the ends of our toes and fingers. The inhabitant of another planet, who had never seen man before, would then naturally exclaim, "What an awkward clumsy creature! How slowly he moves, stumbling at every step! Strange that a being should be thus formed only to be unhappy!" Thus we reason concerning things of which we know nothing, and thus the natural historian continually reasons while speaking of those

wild animals which he has never seen except in a captive state.

Waterton kept a Sloth in his room for several months; he often carried him into the open air, and then put him down in order to watch his movements. If the ground was rough, he would pull himself forward, by means of his hind-legs, at a tolerable pace, and always towards the nearest tree; if smooth and well-trodden, he seemed embarrassed, and would sigh so heavily, and look so weary, that one might almost fancy him to be in pain. But his favourite resort was the back of a chair; thither he would climb and remain contentedly for hours, resting on the upper bar, and uttering occasionally a low and inward sound, to invite his master to take notice of him.

This singular quadruped lives entirely, when in a wild state, on the branches of trees, and never leaves them, except by constraint or accident. The eagle soars on high, and inhabits the craggy rock; the rabbit forms a burrow, wherein to hide himself; reptiles frequent marshy places; and the monkey and the squirrel seek for the shelter of the woods. Each may change his relative situation without much inconvenience, but the Sloth is formed, not to live like his neighbours of the forest, on waving branches, but under them. He moves suspended from the bough to which he clings, and he sleeps suspended from it. Hence it is necessary that his construction should be widely different from that of every other quadruped. His strange conformation is, therefore, at once accounted for; and instead of leading a painful and melancholy life, he possesses as

largest share of happiness as any of his transatlantic brethren.

But though moving beneath the branches of a tree, the Sloth does not hang head downwards, like a bat. When asleep, he supports himself from a branch parallel to the earth, having first grasped it with one paw, and then with the other, and after that, bringing up his legs, one by one, to the same branch, so that all four are in a line: thus situated, he seems perfectly tranquil and at ease. Had he a tail it would be much in the way; if drawn up between his legs, it would interfere with them, and were he to let it hang down, it would become the sport of the winds, or of some chattering monkey, who might amuse himself to the unspeakable annoyance of the Sloth.

Waterton also notices a peculiarity in his hair, which has not been mentioned by any other naturalist. It is thick and coarse at the extremity, and gradually tapers to the root, where it equals in fineness a spider's web. His colour, too, so closely resembles that of the moss which grows on the branches of forest trees, that it is extremely difficult to discover him. If we examine further the formation of the fore-legs, we shall perceive that their firm and muscular texture is admirably adapted to support the weight of his body, both in climbing and when at rest. Instead, therefore, of denouncing the Sloth as a clumsy creature, incapable of joy and full of sorrow, we ought to consider that he is in every respect most wonderfully adapted to his extraordinary mode of life.

The Indians say proverbially, "When the wind

blows, the Sloth begins to travel." In calm weather he remains tranquil, not liking, most probably, to cling to the brittle extremity of the branches, lest they should break under him while passing from tree to tree; but as soon as the wind rises, the branches of the neighbouring trees are driven together, and then the Sloth seizes hold of them, and safely pursues his journey. Yet his progress is seldom thus impeded, for it rarely happens that the weather is calm for a whole day; the trade-wind generally commences about ten in the morning, and thus assisted the Sloth may set off after breakfast and travel a considerable way before dinner. He journeys in his native forests at a good round pace, and were our naturalists to see him pass from tree to tree, they would never think of calling him a Sloth.

It is, therefore, evident that the accounts which have been transmitted from father to son respecting this calumniated animal, are erroneous on two accounts: first, that the writers of them have not observed him in his native woods; and secondly, that they have described him under circumstances foreign to his nature. "The Sloth," says Waterton, "is as much at a loss how to proceed on his journey upon a smooth and level surface, as an Indian would be who had to walk a mile in stilts upon a line of feather-beds."

As Waterton was crossing the Essequibo one morning, he saw a large two-toed Sloth on the ground. It was impossible to conjecture how he got there, unless, indeed, he had fallen when asleep, and an Indian said he had never surprised a Sloth

so circumstanced before ; the creature could hardly have come there to drink, for the branches of the trees dipped into the water, and afforded him a safe and easy access. Be this as it may, his situation was one of extreme difficulty ; for though the trees were not more than twenty yards distant, he could not make his way through the sand in time to escape ; he therefore threw himself upon his back, and offered a gallant defence with his fore-legs. "Come, poor fellow," said the narrator to him, "if thou hast got into an hobble to-day, thou shalt not suffer for it ; I will take no advantage of thee in thy misfortunes. The forest is large enough for thee and me to rove in ; go thy ways up above and enjoy thyself in these endless wilds : it is more than probable that thou wilt never have another interview with man, so fare thee well !" On saying this, Waterton took up a long stick, held it out for him to hook on, and then conveyed him to a high and stately mora-tree. As soon as he came in contact with a branch, all was right ; and the traveller could plainly see, as he climbed up into his own country, that he was in the right road to happiness. He ascended with wonderful alacrity, and in about a minute had almost reached the topmost bough : he then went off in a side direction, and caught hold of the branch of a neighbouring tree, from which he proceeded towards the depth of the forest, while Waterton stood looking after him in astonishment at his singular mode of travelling. He followed him with his eye till the intervening branches closed between them, and he lost for ever the sight of his two-toed Sloth. The traveller was going to add,

“that he never saw a Sloth take to his heels in such earnest, but the expression would not do, for the creature has no heels.”

So much for this harmless unoffending quadruped. He holds a conspicuous place among the animals of the New World, and is the only creature that passes life suspended by his feet from the branch of a tree. The monkey and the squirrel will seize a bough with their fore-paws, and pull themselves up, or rest, or run upon it, but the Sloth, after securing a firm hold, still remains suspended, and glides beneath one branch till he can lay hold of another. Whenever Waterton observed him in his native wilds, whether at rest, or asleep, or on his travels, he continually maintained his position. It is even evident that he cannot be at ease in any situation where his body is above his feet*.

Sloths are also frequent in the woods of Terra Firma. They frequent the caoba, the cedar, the maria, and the balsam, though carefully avoiding the deadly manchineel, with its delicious-looking fruit. Nor is this extraordinary instinct confined to the Sloth; all animals instinctively pass it by. The squirrel eyes it askance in his rapid bounds; monkeys, when gambolling through the forest, never cling to the branches of this dreaded tree; the weary elk lies not down to rest beneath its shade; nor does the smallest bird pluck from off its trunk a fibre or a moss with which to construct its nest. The hospitable Habella de Carthagenas is, on the contrary, sought by every living creature.

* WATERTON'S *Wanderings*. First and third Journey.

Indians hasten to gather its almond-like fruit as a never-failing remedy for the bite of malignant serpents; birds nestle at the fall of night among its branches; and various animals resort beneath its shade as to a place of rest. Yet the habella often grows at a short distance from the manchineel: the same earth nourishes the roots of each, the same soft summer winds play among the branches, the same warm sun brings forth the greenness in the leaves, and the varied hue of the blossoms; yet how great the difference! One bears a poisonous apple, the other a sweet nutritious fruit. Tamarinds and medlars, cassias and bananas, bejuocos and palms, also grow in the same soil, and are equally dissimilar.

But among the various productions of Terra Firma, vegetation displays its greatest luxuriance in the palm; groups of these noble trees lift their heads far above the towering branches of innumerable others, and form a grand perspective on the mountains. One produces the cocoa, another dates, a third, called palma real, a small unpalatable fruit, the fourth a kernel of delicious flavour. Palm wine is equally extracted from the different species, and both Negroes and Indians well know how to make that incision in the trunk from which the sap exudes. Habelas also, of which we have just spoken, differing in size and colour, are abundant in the forests, in those parts especially which are the haunt of venomous serpents. Those who frequent the forests, either to fell the trees or hunt the game, never fail to eat a little of the nut fasting. Thus protected, they go without apprehension to their work, and fearlessly explore the tangled thickets, or walk

beside the margin of those swampy places which invariably harbour the most dangerous reptiles. So extremely subtle is the juice of the habella-nut, that those who eat of it are not afraid to encounter them ; and it is said that if they have even omitted the usual precaution, a small quantity eaten immediately after being bitten, effects a ready cure.

Innumerable vegetables, which grow beneath the shelter of the forest, or along their 'sunny borders, also continually arrest the attention of the naturalist. Beautiful flowers, too, are there, and many of those elegant species which are cultivated in our green-houses. You may see them bend beneath the rapid tread of the light-hearted squirrel, and often, swift as the eye can follow it, a path is made through acres of elegant mimosas, smooth as a lawn over which the scythe has passed, while on either side the slender stems bend and tremble, as if they feared the return of the rash intruder. There are also various other vegetable productions of exquisite beauty and fragrance, but as yet no Linnæus has arisen to number and describe them. Travellers speak with admiration of the perpetual verdure of the woods, the luxuriancy of the pastures, the towering height of the majestic mountains, and the variety of splendid trees, standing either singly or in groups, which seem to emulate one another in producing delicious fruits throughout the year. Some resemble those of Spain, others are peculiar to the country, while among them innumerable birds of gorgeous plumage, with such quadrupeds as frequent dry places, and of which the fur is generally spotted, glance by with rapid flight, or bounding step,

displaying themselves in contrast with the vivid green of the vegetation that surrounds them.

Pines grow profusely either wild or cultivated. The plant which produces the pine-apple, so called from its resemblance to the cones of the European Pine, often rises about three feet in height, terminated by a dazzling crimson-coloured flower. Nested in the centre of the flower, appears a little greenish-looking apple, and as this increases, the lustre of the flower begins to fade, and the leaves expand, as if to form for it a base or ornament. As the apple still continues to grow on, a crown of beautifully-tinted leaves adorns the head, which gradually enlarges, till the fruit attains perfection. But no sooner does the crown cease to grow, than the fruit begins to ripen, and its greenish tint soon changes to a bright straw colour. Then also, does it first acquire that delightful fragrance which often discovers its place of growth, though concealed from the eye by arborescent ferns, or closely-matted creepers. Prying monkeys love this delicious fruit; squirrels also would seek to regale themselves with its refreshing juices, and in so doing they would not wait till it was fully ripe. But the Pine Apple is guarded with small thorns, which effectually repel them. When it is fit to gather, these dry and soften, and the fruit is easily obtained. The crown, which formed a kind of apex, becomes itself, when sown, a new plant, and the rind, infused in water, produces a cooling liquor, which possesses all the properties of the fruit. Guayabas, also, graceful and fragrant plants; Guineos and Papagas resembling lemons, Guanabanas, Melons, Sapotes, and

Mameis, Limes, and Tamarinds, are seen along the margins of the streams, or in the sunny valleys, or up the rugged flanks of those bold mountains, of which the outlines appear against a sky of the purest blue.



THE MANGROVE.

The sea coasts, though generally abounding in roots and grain, fruits and flowers, are sandy, and scarcely anything will grow there except the Mangrove. Shooting forth collateral branches which bend down, take root, and then spring up, a single mangrove will cover in a few years an extensive

tract of land; but, contrary to the nature of every other forest tree, they require a soil which is continually overflowed. The shores of Terra Firma are therefore covered with them in many parts, and they even extend far inland. Shallow and rapid rivers also are often concealed from the eye by their thickly-interwoven branches, some of which spread almost horizontally, while others rise to the height of eighteen or twenty feet, and so closely are they entwined, and so firm a footing is made by their interlacing boughs, that were it possible to force a way between them, a traveller might safely step from branch to branch across the stream. It is curious to watch the progress of a mangrove forest, the citadel of innumerable monkeys. No sooner does a tree appear above the ground, than knotty and distorted branches rapidly spring forth, and from each knot arises a multitude of others, which form an impenetrable thicket. Nor is it possible, long to discern the shoots belonging to the principal branches, for those of the fifth and sixth production are equal in magnitude to those of the first, each of which are generally an inch and a half, or two inches in diameter, and so closely are they often entwined, that the only method of severing them is by means of some edged tool. The bark is tough and thick, and the leaves of a pale green; but the wood is solid, and so heavy that it sinks in water, and when used for building ships is extremely durable.

Armadilloes belong to the southern regions of America, to Brazil, Paraguay, and Guiana. D'Azara mentions eight species of this extraordinary family;

he tells us, that most of these dig burrows in the earth, and that they excavate these in order to make war on the ants.

Some of the species walk abroad only in the night, and look fearfully around them, if observed. Others quit their retreats equally in the day, and these are said not to be so fleet and agile as their nocturnal brethren; some dwell in forests; others prefer the open plain. Each clan exhibits some peculiar characteristic, but there is no real break in the whole circle; they are distinguished by the scaly cuirass which enwraps them, from every other creature.

Armadilloes were once supposed to feed entirely on vegetable diet. They are, however, decidedly insectivorous, and even, occasionally, carnivorous. The direction of their burrows evinces, as we have just remarked, that they destroy the ants, and these industrious insects quickly disappear, wherever an Armadillo fixes his abode. The restricted limits of the genus (which belongs exclusively to South America) are remarkable, more especially when we consider, that from the facility with which they endure removal to our latitudes, there is every reason to conclude that they would be easily reconciled to countries very different from their own. Yet such is not the case. Wherever placed there they contentedly reside. The Armadillo of the mountain, never intrudes upon his neighbour of the plain.

The different species, too, seem confined to certain parts of America. The Twelve-banded (*Dasypus tatouy*), inhabits the vicinity of Buenos Ayres;

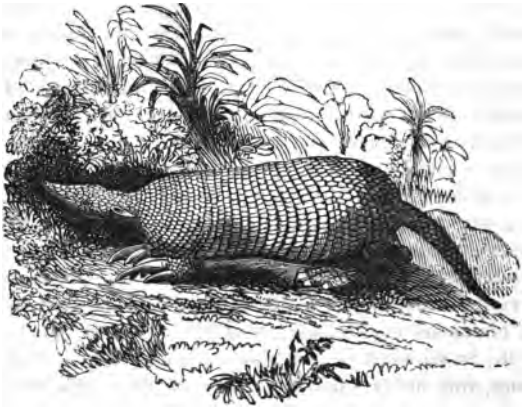
the Hairy (*D. villosus*), extends from thirty-six degrees of south latitude, to Patagonia; the Giant Armadillo (*D. giganteus*), seldom quits the forests of northern Paraguay. And, as one animal is consigned to the hill, another to the valley, a third to marshy places, a fourth to sterile regions, so the nature of the Armadillo is to burrow in sand-hills, like the rabbit. Much time is required to dig him out, and, therefore, the Indians carefully examine the mouth of the hole which is supposed to contain him, and then thrust down a stick. If a number of mosquitoes immediately come forth, they know that it contains an Armadillo; but if there are no mosquitoes, the hole is empty. When this is ascertained, the Indians introduce a long and slender wand into the opening, observe the direction in which it goes, and remove the sand. They then push the stick still further, throw out more sand, and thus proceed till they come up with the inhabitant, which has, meanwhile, been exerting all its strength to make a new passage in the sand, and is often found in an exhausted state. Three-quarters of a day is frequently employed in digging out one Armadillo, and half-a-dozen pits are sometimes opened, before the inmate can be dislodged. Yet, however exhausted, he never forgets to defend his liberty. Those who attack his citadel, must take care how they come in contact with his sharp claws, as with them he can inflict a severe wound, in self-defence. But, when unmolested, he is harmless, and like the hare in Gay's *Fables*,

His care is never to offend,
And every creature is his friend.

It is worthy of remark, that only the back and shoulders of the Armadillo are guarded by a shelly covering. Why is this? Because the harmless and retiring creature has few enemies to dread, and rather requires a defence from stones, and the roots of trees, when excavating his subterraneous dwelling, than for purposes of warfare. His cuirass, therefore, is a partial one. It is formed partly of irregular pieces, which cover the back and shoulders, and partly of regular bands lying between them, each of which are so beautifully composed of bone and muscle, and so curiously wrought together, that the animal can either roll into a ball, or run at full length, or compress himself into the smallest space consistent with his size. Unlike the lobster, which bears about with him a complete suit of armour, or the tortoise, which never ventures from beneath his shelly pent-house, the Armadillo has his back only defended, but when attacked, he rolls himself into a ball, like the pengalen, and is invulnerable. His armour for the back, answers, therefore, a two-fold purpose; it guards him from injury in pursuing his subterraneous labours, and wraps him round when he inclines to roll into a ball. His claws are also admirably adapted for the mode of life to which he is destined; they are large and strong, and he is thus enabled, not only to shovel out both sand and gravel, but even to break off tough roots, and to remove stones of a considerable size.

The Giant Armadillo rarely quits the wooded portions of Paraguay. Amid the thick forests of that region is found the plain of the Volcanitos de

Turbaao, celebrated for its volcanic cones. These cones, from eighteen to twenty in number, are of a darkish clay, with a small crater on each summit, filled with water. They emit, from time to time, a loud dull sound, which is followed, in less than a minute, by the explosion of a quantity of air, and the force with which this air is propelled above the surface of the water, renders it probable that a heavy pressure occurs within the earth. Five explosions generally succeed one the other in about two minutes, and are uniformly accompanied by a shower of mud.



GIANT ARMADILLO (*Dasypus giganteus*).

The Indians say, that these cones have not undergone any change during the memory of man, but that the force and frequency of the explosions vary.

according to the seasons. Few parts of Carthagena are so well deserving of attention as this celebrated spot; itself a vast plain, covered with volcanic cones, whose deep and sullen sounds break at intervals the silence of the place; and bounded by a forest of palms, beautifully varied with balm of tolu trees, and the flowers of the *Nymphaea* and the *Cavanillesia mocundo*, whose membranous and transparent fruit resembles elegantly shaped lamps, suspended at the ends of the branches. Botanists repair thither from the beautiful village of Turbaco, in search of plants, and are amply rewarded, not only by collecting such as grow within, or on the verge of the forest, but by such as seem peculiar to the marshy plain of the Little Volcanoes. The situation of the village also is one of peculiar interest, and affords a secure retreat to Europeans who are unable to endure the excessive heat of Carthagena, and of the arid coasts of Baru and Tierra Bomba. At an elevation of nearly a thousand feet above the level of the sea, the inhabitants enjoy the most delightful breezes, especially in the night; beautiful views extend on every side, while, to the south-eastward, a majestic forest skirts the village, and reaches far as the canal of Mahates, and the river Magdalen. The houses, built of bamboo, and covered with palm-trees, rise among the limestone rocks, which often contain numerous fragments of petrified coral; from these clear sparkling streams leap forth, even by the doors of the inhabitants, and are often overshadowed by the splendid foliage of the *Anacardium caracole*, a tree of colossal size, to which the natives attribute the property of attracting from a dis-

tance the vapours that are distributed throughout the air.

Scarcely can the native of a temperate zone picture to himself the beauty and magnificence of those noble trees which adorn the vast forests of equinotial America. Such as attain the most stupendous height and size, are often covered with a profusion of climbing plants, and even the same lianas which trail in a different latitude upon the ground, run up the giant stems, till they reach the topmost branches, and pass from one to the other, presenting their gaily tinted blossoms to the air and light. Hence it often happens, that the botanist confounds the flowers, fruits, and leaves, which belong to different species, because he cannot separate the interlaced plants. The traveller who presses on amid the continually recurring luxuriance of vegetation, till he reaches the banks of the Cassiquiare, where that river branches off from the Oroonoko, would soon forget all which had before astonished or delighted him in the aspect of its stupendous forests. There is no longer any breach; a living palisade of tufted trees skirts the noble river. That river is at least four hundred and twenty-six yards across, and on either side extend two enormous barriers, clothed with foliage and lianas. To penetrate them is impossible. Humboldt, to whom we owe the interesting narrative, endeavoured to land with his companions, but was unable to step out of the boat. They sailed down the river for some time, hoping to discover, not an opening, for none existed, but a spot less wooded, where the Indians might gain, by means of their hatchets and manual labour,

space sufficient to contain twelve or thirteen persons. Most of the trees which thus formed a living fence were more than one hundred feet in height, while some, especially of the palm tribe, attained an elevation of from one hundred and fifty to two hundred feet.

Humboldt noticed during his progress through South America, many extraordinary specimens of vegetable grandeur. He measured, on the banks of the Atabapo, a Bomban ceiba, more than one hundred and twenty feet high, and fifteen feet in diameter. Near the village of Turmero, south-west of the city of Caraccas, was found the celebrated Zamang del Guayra, a species of mimosa, of which the hemispherical head shadowed a space of six hundred feet. The branches extended like an immense umbrella, drooping at the extremities, and forming a canopy at the height of about twelve or fifteen feet from the ground. The circumference of the head in this extraordinary species is uniformly regular, varying in different specimens from 204 to 198 feet.

Beautiful, too, is the effect produced by the blended foliage of the cocoa, the *Theobroma cacao*, and that of the coral-tree, *madre del cacao*, or mother of the cocoa, which spreads its fostering arms above the cocoa, as if to shield it from the fierce beams of a tropical sun. This guardian plant rises to a considerable height, and is covered with bright yellow blossoms, while the cocoa is not unlike a cherry-tree in form, and seldom exceeds ten feet in height; but the general aspect of the tree is pleasing to the eye; its oblong and pointed leaves

are, when young, of a pale red, and the flowers, which generally spring from out the larger branches, are nearly of the same hue, mixed with yellow. Unlike many trees which present in their leaves and flowers and fruit the most striking contrast, even the oval pods, when ripe, are red or yellow. The effect, therefore, of the blended foliage is extremely pleasing, especially when seen amid the mountains, and often in situations of peculiar and romantic beauty. Two varieties are cultivated by the natives, which they call *forastero* and *creole*. The first produces fruit at the end of three years, and though not generally considered equal to the former, is far more productive, and has in consequence nearly superseded it. The second bears fruit after five years' growth, and continues in perfection for twenty years. Manumissions were granted formerly in Trinidad to every slave who could at any time deliver one thousand cocoa-trees to his master: it was required that they should be planted by himself in an allotted space. Many of the most industrious purchased their freedom in this way, as the cultivation of them did not infringe upon their daily tasks.

The gathering of the seeds of the cocoa-tree occurs twice every year. The principal season is in December, though a considerable number are collected in June. Men and women may be seen busily employed, and even children, in pulling off the pods, from which the seeds are speedily extracted and placed in heaps on platforms of clay, where they are suffered to ferment for a day and night. They are then dried in the sun, in a manner like that employed in preparing coffee; and when

required for the table, are roasted till the husks may be taken off, after which they are ground to a fine powder. Chocolate is merely a preparation of the cocoa made by bruising it into a paste, which is afterwards smoothed with an iron. This is commonly flavoured with cinnamon and vanilla.

Plantain-trees are found to grow profusely, wherever the nature of the soil and the degree of solar heat render them essential to the well-being of the inhabitants. Humboldt relates that they present their fruit indifferently to the natives of equinoctial Asia and America, of tropical Africa, and the islands of the Atlantic and Pacific oceans; and that, when the heat of the country exceeds 75° of Fahrenheit, the banana forms a principal article of food to a large portion of mankind within and near the tropics. Standing singly or in groups, the plantain produces a pleasing effect, especially when contrasted with the luxuriant foliage of tropical plants. The top is surmounted with a cluster of leaves and a spike of flowers, that rise from out the centre. The leaves are long and narrow, smooth and beautiful to the eye, and strengthened down the centre with a firm middle rib. The fruit is about two inches in diameter, yellow when ripe, and pleasant to the taste.

This valuable plant has not been found in an uncultivated state, nor is it generally increased by seeds. The wildest tribes of South America, who depend upon the fruit for their subsistence, transplant the suckers around their huts, and gather from them ripe fruit in less than a year. When the fruit-stalk is cut off, a sprout quickly appears beside

it, and this also yields a plantain in three months. The labour of cultivation is, therefore, slight; it merely consists in cutting the stalks laden with ripe fruit, and of digging once or twice a year around the roots. A spot of land consisting of little more than a thousand square feet will contain from thirty to forty banana plants; and each cluster of bananas produced on a single plant often yields from one hundred and sixty to one hundred and eighty fruits. The weight of a cluster is reckoned at forty pounds, consequently such a plantation would produce more than one thousand pounds of nutritive substance. M. Humboldt further calculates that as thirty-three pounds of wheat, and ninety-nine pounds of potatoes, require the same space as that in which four thousand pounds of bananas are grown, the produce of bananas is to that of wheat as 133 to 1, and to that of potatoes as 44 to 1.

The tribe of which the plantain is a member comprises amomums, strelitzias, and heliconias; their stems are short and juicy, and they are crowned with large and delicate silky leaves. One of these, the ginger, is well known; while the strelitzia, a native of the Cape of Good Hope, is celebrated for the splendour of its blossoms, and the heliconias for their balsamic and nutritious qualities.

Travellers in the far-extended wilds of Guiana are often astonished at the number of ants which are seen among the grass and in the trees. Their nests, formed on thick boughs, are four or five times as large as those of the rook, and they have each a

covered way to the ground. Through this the whole community are perpetually passing and re-passing, and if any part is destroyed, they immediately repair it. Others throw up hillocks eight or ten feet high; these, constructed of hard and yellow clay, are of the form of a spire. Others, again, which place their nests in trees, have no covered way, but journey up and down the trunks. Travellers frequently observe a procession of these industrious creatures extending for a mile in length, each carrying in its mouth a green leaf to the nest, most probably to feed their young. The species furnish an abundant supply of food to three kinds of ant-bears, quiet and inoffensive creatures, that range the plains and forests of the New World. The smallest is not larger than a rat, the next is of nearly the size of our common fox, and the third, a stout and powerful animal, measures about six feet from the snout to the end of the tail. He is chiefly found in the inmost recesses of the forest, within reach of those low and swampy parts which border the creeks, and are shaded with high trees. There he wanders up and down in quest of ants, and of these he readily obtains a sufficient quantity. He cannot travel fast; the Indian is far superior to him in speed, and yet, though without swiftness to aid him in escaping if attacked, without teeth that might assist him in self-defence, and without the power of burrowing for concealment, he ranges through the wilds in perfect safety, fearless of the fatal pressure of the serpent's fold, or the teeth of the famished jaguar. Should any brother of the forest wantonly insult him, he hugs the offender

closely, and holds him till he dies either from suffocation or the want of food. Nor does the ant-bear appear to suffer while thus imprisoning his enemy, for no animal can equal him in abstinence, except, perhaps, the land-tortoise. His skin is of a texture that resists the bite of a dog, and his back is protected with thick and shaggy hair, while his immense tail is sufficient to cover his whole body.

Indians fear to come in contact with this creature; even when he is disabled in the chase they never think of approaching him till he is quite dead, for his fore-legs are strong and muscular, and armed with tremendous claws.

"If," says Waterton, "in taking a sketch of the ant-bear you judge of the way in which he stands from that of other terrestrial animals, the sloth excepted, you will be in error." Stuffed specimens and drawings represent his fore-claws in the same forward attitudes as those of a dog or bear when standing, but this would be to him a painful attitude; the length and curve of his claws do not admit of such a position, but he goes entirely on the outer side of his fore-feet, which are bent inwards, and resemble a club. He is then quite at ease, while his long claws are so arranged as not to hurt him, and are prevented from becoming worn like those of a dog by actual contact with the ground. Two glands were also observed by the same naturalist beneath the root of the tongue; from these a glutinous liquor exudes, which is very useful to the animal in catching ants, as when he thrusts his tongue into a nest the insects adhere to

it. These glands are similar to those in the lower jaw of a woodpecker: the secretion is very clammy and adhesive, but on becoming dry it loses these qualities, and may be easily pulverized.

The ant-bear is a pacific creature. He never begins an attack, but were he to apply to the Herald's Office for a coat of arms, his motto might be "*Noli me tangere.*" As both his habits and his haunts differ materially from those of every other forest animal, their interests never clash, and he might live to a good old age, and die at length in peace, were it not that the Indians wage with him perpetual war for the sake of his flesh. A poisoned arrow often lays him low while basking in the sun or straying among his usual pasture-grounds, the ant-hills, and he falls beneath a power which he can neither circumvent nor overcome. But if closely attacked, he can fight manfully; if likely to be overcome by dogs, he throws himself upon his back, and should he catch hold of his enemy with his tremendous claws, the assailant inevitably pays for his rashness with his life.

Three species of ant-bear are recognised by naturalists. One of these, the maned (*Myrmecophaga jubata*), inhabits low and swampy grounds throughout an extent of country reaching from Paraguay to the river Plata; amid those regions where numerous trees killed by the beaver, or worn out with age, are intermixed with the narrow fringe of beautiful vegetation which marks the course of the river, while their distorted and bleached trunks and stems, strongly contrasted with the surrounding objects, are often rendered doubly interesting by affording a

support to the nest of the bald-eagle, elevated like a beacon in the horizon. There the Maned Ant-Eater may be seen, proceeding on his way with a slow and heavy step, scenting the ground as he goes, till, hearing the cry of the hunter, he bounds off in a kind of measured gallop; but if closely pressed, he sits down to receive the enemy, and extends his powerful claws as if daring them to approach.

This quadruped, in a wild state, subsists almost entirely on ants. It seems incredible how such diminutive insects can support so large an animal, but the wonder ceases when we consider the myriads which swarm in a single ant-hill, and that the face of the country is often covered with them.

The Tamandua of Buffon differs in his habits from the Maned. Instead of moving slowly on the ground, he climbs high trees by the aid of his prehensile tail, to feed on the honey which is often secreted by stingless bees in the hollow of the time-worn trunks. The Little Ant-Eater (*M. didactylu*), also lives in the forest, where he attacks such ants and insects as hide beneath the bark. You may see him clinging to the branches with his tail and paws, peeping cautiously into the lichens which cover the stems of aged trees; and when he finds a quarry of trembling fugitives, he pulls aside every intervening barrier, and destroys them without mercy.

Unlike such animals as live on grass, the Ant-Eater has a mouth lengthened out, so as to be somewhat of a tubular form, and his tongue is cylindrical and extensile. Though provided with

certain bones or processes at the entrance of the throat, and useful most probably in keeping back extraneous substances that might be injurious to the stomach, this species has no teeth, because they are unnecessary to such creatures as live on ants. The Ant-Eater depends altogether upon his tongue, and the tongue, therefore, is of a great length, and covered with a glutinous saliva. It is easily thrust into an ants'-nest, or laid upon the summit of the mound which they throw up, while the unsuspecting insects either pursue their usual occupations, or else mount upon it and are immediately entangled: hundreds are thus entrapped, for ants are inquisitive, and a new object immediately attracts them. Nothing is made in vain, and every creature has some assigned duty to perform. Ant-Eaters, confined to warm climates, are no doubt extremely useful in keeping down the redundancy of insect life; as ichneumons on the banks of the Nile, and vultures concealed in such trees as grow within sight of its banks, prevent the crocodile from becoming numerically dangerous.

A class of plants has recently been discovered in South America, concerning which as yet but little has transpired. These are the Orchidæ, or Orphyses, a beautiful tribe, which, like the orchises of our own country, grow best in lonely places, and will not thrive, even beside the cottage door. I have often brought orchises from the meadows or the wood-side, and planted them in a sunny border; they looked well till the season of flowers was over, they sprung up the next year, and looked

as beautiful as before, but soon they grew pale and withered, and I sought in vain for them when the time of flowers came again. They love the purest air of heaven, to open with the light of morning to the clear blue sky, to grow in sunny brakes, and on the sloping side of hills, where the wild thyme and eyebright mingle their beauty and their fragrance. Several species are found in England, and two of them, the bee and fly orchis, grew in one of the loveliest spots, a little common near our village, belted towards the north with deep beech woods, and sloping gradually into the valley. The lark sprung rejoicing with the early morning from out his nest among the long grass and juniper that mantled its steepest side; and there butterflies and insects came trooping to bask in the warm sunbeams, and to close and open their beautiful wings among the fragrant blossoms of the thyme. It was curious to observe how nearly the bee-flower and the living bee resembled one the other; the fly, too, and the orchis that bears its name. When the light step and joyous laugh of the village children, who hastened thither after school to gather flowers, had frightened away the bee or fly, they would start and wonder that the mimic insect remained unmoved, and yet they feared to approach nearer, lest the bee should spring up with an angry hum and sting them, so close was the resemblance. But far more curious are the orchidæ of South America, which grow beneath the shade of high trees, and on the border of damp forests. Some resemble gnats, others butterflies. Travellers deserving of credit relate that such small monkeys as gambol among

the branches, and such brilliant lizards as dart among the grass—birds, too, admired for the exquisite beauty of their plumage, and splendid butterflies, unknown in Europe, are faithfully represented in the flowers of the orchidæ.

The Coypou or Coypou Rat (*Hydromys*), common to the provinces of Chili and Buenos Ayres, though rarely seen in those of Paraguay, is an amphibious animal. A natural historian would readily pronounce that the creature occasionally inhabited the water, for the hair of its tail is thin and short, stiff, and of a dirty red colour, while the body is defended in some parts with scales, in others by a thick warm felt beneath the hair which keeps it from being wet. The colour of the fur admirably conforms to its assigned locality while on land; it is of a deep brown or earthy tint, and hence the coypou readily eludes the vigilance of its enemies, while running along the ground, from which it is scarcely distinguishable. This merciful provision for their safety, seems peculiar to animals of a mild and retiring disposition. We discover nothing analogous in beasts of prey; but in the mouse and coypou, the rabbit and the beaver, it is remarkably obvious; in singing birds also, and even in the females of such as are distinguished for the brilliancy of their plumage; obviously because, if invested with bright colours, they would be readily discovered while sitting on their nests, or resting with their young among the bushes.

Pecaries represent, in the thick forests of South America, the swine of the ancient world, but few

interesting particulars occur in the biographical notices of these recently discovered quadrupeds.

Both species inhabit forest land. Waterton frequently saw herds, consisting of several hundreds, traversing the wilds of Demerara and New Guiana; and while thus migrating from one favourite haunt to another, they often fall a prey to the Indians, who shoot them with poisoned arrows. When one of the company is alarmed, by an unusual sight or sound, he makes a signal by striking the ground with his feet, which signal is repeated by the rest; each one is immediately on the alert, and the whole party speedily surround the offender, whether he be weak or strong, whether a jaguar or a puma, or even man himself. The danger is then great. Woe to the hunter if no tree is within reach, or if, when firing, he has not killed the leader; Pecaries do not regard the loss of common lives, and as the herd diminishes, the fury of the survivors augments; but if the leader falls they take to flight. The jaguar, the great predatory of the American forest, is often seen to follow these herds in silence, and to seize the opportunity of some individual being in the rear to attack and kill him; when this is done, he springs into the nearest tree, till the troop have passed and left their dead companion.

The White-lipped Pecary, on the contrary, not availing himself of the benefit which results from combined efforts, flies at the first attack, and only defends himself when reduced to the last extremity. He is seen generally with one, or at most with few companions; he keeps apart from the more sociable

species, and will not even frequent the places of their resort.



THE TAGNICATI, OR WHITE-LIPPED PECARY, (*Dicotyles labiatus*.)

The forests in which these animals abound are the favourite resort of the celebrated Campanero of the Spaniards, which inhabit, in common with many other parts of South America, the beautiful woods on either side the Essequibo, and among those hills which rise in fine gradations one above the other, and are covered with trees of gigantic size and height. Their foliage is sometimes of a lively purple, and again of the deepest green, while the caracara, a brilliant creeper, extends its scarlet blossoms from branch to branch, and gives to such as it adorns the effect of being hung with garlands. This is the haunt of the campanero, and there his melan-

choly note, which resembles the toll of a church-bell, may be heard at the distance of three miles. He generally perches on the topmost branch of an aged mora, and neither sound nor song from any of the winged inhabitants of the forest, not even the clearly-pronounced whip-poor-will, causes such astonishment as the toll of the campanero. You may hear his toll, and then he pauses for a minute; then a toll, and again a pause. Then he is silent for perhaps a quarter of an hour, again a toll is heard, and all is still again. "Actæon," as Waterton observes, "would halt in mid chase, Maria would defer her evening song, and Orpheus himself would stop his lute to listen, so sweet, so novel, and romantic is the toll of the pretty snow-white campanero." Here, too, is heard the one, solitary, reiterated word *houtou, houtou*, which comes at intervals upon the ear, as the distinct and mournful voice of one who has lost his way in the wild forest, and who calls, and calls again, in hope of a reply. And there also resounds the cry of the whip-poor-will.—"Lone whip-poor-will!" thus sung the sweetest of the poets of America, one who has a fine feeling for nature, and who has watched her in her wildest solitudes:

Lone whip-poor-will!

There is much sweetness in thy fitful hymn,
 Heard in the drowsy watches of the night.
 Ofttimes when all the village lights are out,
 And the wide air is still, I hear thee chant
 Thy hollow dirge, like some recluse who takes
 His lodging in the wilderness of woods,
 And lifts his anthem when the world is still;
 And the dim, solemn night, that brings to man

And to the herds, deep slumbers; and sweet dews
To the red roses and the herbs, doth find
No eye, save thine, a watcher in her halls.
I hear thee oft at midnight, when the thrush
And the green roving linnet are at rest,
And the blithe twittering swallows have long ceased
Their noisy note, and folded up their wings.

M. LELLAN.

The Tapir, with the exception, perhaps, of the recently-discovered *Equus bisulcus* of Molina, is the largest animal in the New World. Instead of the magnificent quadrupeds of Europe, Asia, and Africa; instead of the elephant and rhinoceros, the hippopotamus, the camelopard and the camel, we observe on the plains and in the forests of America, animals on a smaller scale. They are not less perfect of their kind, nor less capable of being rendered useful, though apparently less energetic.

The Tapir is about the size of a small cow, of gloomy, or rather melancholy aspect, and yet perfectly inoffensive; he comes abroad only in the night, and delights in the water, where he dwells oftener than on land. He lives in marshy places, and never wanders to any considerable distance from the margins of lakes and rivers. When alarmed, pursued, or wounded, he plunges into the stream, remains a considerable time beneath the surface, and always re-appears at a distance from the scene of his immersion. These habits, which he has in common with the hippopotamus, have induced some naturalists to suppose that he belongs to the same species. But the animals are as remote from each other in their nature, as the countries they frequent.

To be convinced of this fact, we need only compare the above description with that we have already given of the hippopotamus.



THE TAPIR (*Tapir Americanus*).

This creature is seen occasionally on the banks of the Mississippi; amid those dreary and pestilential solitudes which are trodden only by the wandering Indian; where scarcely a living object meets the eye, excepting when a huge alligator floats along, apparently asleep, and basking on some aged tree, riven by the whirlwind from out its native forest, and holding forth its bleached branches as if imploring assistance. The tapir is well fitted for the desolate and uninhabitable regions through which the lonely Mississippi rolls its vast volume of dark and turbid waters. His gloomy and melancholy aspect, and

nocturnal vigils, accord with the thick undergrowth of cane, which often extends for many leagues beside the river, and the deep forests, which cast their gloom and shadow over its winding course. A recent traveller relates that the prevailing character of the Mississippi is that of solemn gloom; that he had trodden the passes of the Alps and Apennines, and yet never felt how awful nature is, till he was borne on these waters through desolate and uninhabitable regions; that further, though the scenery on either side is almost uniformly level, yet there is no scenery on earth so striking; rocks and mountains could add nothing to its sublimity; to the heart and perception of the spectator, the Mississippi would be alone. But if thus impressive in a bright and sunny day, how deeply solemn is its character at night; while voyaging upon its stream, beneath the clear cold moon, when even stars of the first magnitude are scarcely visible, when all is silent, and not a sound is heard on the wide expanse of the lonely river, or in the deep dark forest. At such an hour, he who, sad and thoughtful, gazes on the forest and the waters, thinking perhaps of home and friends, on the further side of the vast Atlantic, is often startled from his reverie by the dash of the huge tapir into the water; or by the crashing of the cane brake, as he emerges from out its fastness.

We trace along the rugged flanks of the Southern Cordilleras, large herds of Lamas, those gentle and unoffending creatures, which were the only beasts of burden before the conquest of Peru.

They form a secondary tribe of camels peculiar to America, but instead of that heavy and stupid aspect, that strange hunch, and bent neck, which distinguishes the laborious and patient camel, lamas carry their heads nearly perpendicular, while their long pointed and moveable ears, and large animated eyes, give them an air of sprightliness and activity. But the chief organic difference which distinguishes them from true camels, consists in the formation of the toes, which are not united by a common sole, and in their being destitute (because it is not necessary to them,) of that wonderful apparatus which enables the Bactrian and Arabian species to traverse vast and arid deserts, in which it is difficult to meet with water. Owing to the construction of their toes, they move swiftly along rocky pathways, also on slippery ice and frozen snow, places where the camel could not tread without danger, and on which the singular conformation of his foot, so wonderfully adapted to heavy sands, and the unbroken surface of the desert, would prevent him from venturing.

Lamas are inquisitive and timid creatures, gentle, and rather shy, yet easily domesticated, and capable of great attachment to their keepers, nor are their services restricted to those of a domestic nature, for the skin is useful, and the wool an important article of commerce. Few animals are more pleasing to the eye: their hair is long and soft, woolly and elastic; their carriage graceful, and when seen in front, with the splendid silvery white clothing of the throat and breast, hanging like a mantle below the knees, they produce a beautiful effect. The finest specimens stand nearly six feet from the ground to

the top of the head, and are about five feet long, from the breast to the tail.

Though the increase of horses, and the superior vigour and sagacity of mules, have diminished the importance and consequently the numbers of the lama, still, however, many are kept by the poorer inhabitants. They are to them what the ass is to the peasantry of our own country: a useful and willing quadruped, supported at a small expense, and capable of undergoing much fatigue. When overloaded, they are apt to lie down, and refuse to rise; yet the larger species will carry cheerfully a full-grown man, and trot, or rather run, with great swiftness for several miles. The weight usually laid upon them does not exceed one hundred and fifty pounds, and this they will convey from fourteen to twenty miles in a day among precipices and over rocks. They often bear without reluctance large baskets containing cochineal, that valuable species of gall insect which adheres to the opuntia, and sucks its crimson-coloured juices; one of the most important articles of commerce, and which gives to the silks and stuffs of Europe their finest tints. You may also meet these useful creatures among the passes of the Andes, loaded with strong ropes made from the bark of the Maho tree, or bearing timbers of the light-wood, which although heavy to the eye, is buoyant and light as cork, and is used to make floats for conveying merchandise along the sea-coast.

Lamas in a wild state abound throughout the frightful deserts of the Andes, amidst those lofty mountains which, based on others, and shrouded with snow that never melts, rise to a dizzy height.

In those dreary regions, in the wildest tracts of stone and sand, beside the mountain of Cotopaxi, a beautiful natural phenomenon occasionally relieves the melancholy excited by the hideous roaring of the mountain, and the mournful sound of the gusty winds that sweep across the desert. Ulloa noticed this appearance at the break of day, when the mountain on which he stood was encompassed with thick clouds, till the rising sun dispersed them into vapour. Suddenly appeared on the opposite side to that where the sun rose, the image of Don Ulloa and his companions, within three concentric rainbows, all of different colours, and bounded with an arch entirely white. They were perpendicular to the horizon, and as each individual moved, the phenomenon moved also in the same direction and order. The party consisted of six persons, and each one discerned the glory with which his image was enveloped, though he saw not that which equally distinguished the others. As the sun ascended, the diameter of the arches gradually began to change; till at length the beautiful vision disappeared.

Wild Asses are common in the magnificent and varied scenery which the lamas inhabit. They are most numerous around the village of Mira, in Peru, and hunters frequently go forth in pursuit of them, mounted on horses trained for the sport, and attended by Indians on foot. When arrived at the hunting grounds, they form a circle around the herd, and drive them towards the nearest valley, in order to noose and halter them. But this is attended with considerable difficulty, for the wild ass is a

powerful and ferocious creature; when he finds himself in danger of being taken, he makes furious efforts to escape, and if one of the company forces a way through the circle of his enemies, the others follow him with irresistible impetuosity. Fleet as horses, and almost of unconquerable spirit, they rush onward with incredible velocity; neither rocks nor precipices, neither rivers nor deep ravines, retard them in their headlong course; if attacked, they adroitly defend themselves with their heels and mouths; and this so instantaneously, that without slackening their speed, they often maim the stoutest of their pursuers.



THE WILD ASS.

But when noosed, they are thrown down, and secured with ropes; and thus they continue, till, exhausted with struggling, they allow themselves to be fastened to one of their tame brethren, and conducted home. Yet even this is attended with danger, as, when apparently subdued, they will often suddenly spring up and seriously injure the person who endeavours to control them. But if once constrained to bear a load, even the most active and ferocious lays aside his love of liberty and independence. It seems as if the being loaded subdued at once his spirit, and he soon assumes the quiet and plodding look which distinguishes his tribe. No longer a ranger through the desert, snuffing the fresh air in his joyous course, himself as free and uncontrolled, he quietly goes along the road, and obeys, without a murmur the commands even of childhood and old age.

Wild asses, when ranging in their native deserts, will not permit a horse to feed among them. Should one happen to stray into the places where they pasture, they fall upon him before he has time to escape, and soon destroy him.

Few persons like to live in their vicinity, for the noise which they make is terrible. If one begins to bray, another answers, and presently the whole brotherhood unite in chorus. The echoes are then awakened, and no language can adequately describe the tremendous clamour which ensues.

The Guanaco (*C. huancus*) of the Andes, and the Paco or Alpaca, covered with long, soft, woolly, delicate, and elastic hair, approaching that of the Angora goat, are aboriginal throughout a wide

extent of country. Lightly bounding and graceful creatures, they seem in character with the beautiful vegetable productions of their native regions, Peru and the Brazils.



THE ALPACA.

The pomegranate and the lemon, the orange and the fig-tree, the citron and the cocoa, which grow luxuriantly in these countries, are well known to the inhabitants of Britain, and require no particular description here, but we shall dwell more at length on the wallaba, and Peruvian bark. The first is common in the woods; it is a resinous tree, somewhat resembling mahogany.

Trees yielding the Jesuit's bark grow generally in the interior of Peru. They rise to a commanding height on the mountains of Quito, tapering upwards

from the base, and branchless till within a short distance from the top, where they shoot out and present the figure of an hemisphere. The leaves in shape resemble those of the English plum; they are dark green on the upper side, and beautifully relieved beneath with brown: the flowers are red, like the earth from which they spring. Occasionally the bark trees grow in groups, but more generally intermingled with others, on rocky banks, or beside some sparkling stream, where the deep green of their leaves presents a beautiful appearance when agitated by the wind, as waving up and down, they discover the shining brown of their under surfaces. The Indians resort in great numbers, during the months of September and October, to the wooded mountains of Quito, where they erect temporary huts in sheltered places, and avail themselves of every intermission of the rain, which falls almost incessantly in those high regions, to cut down, or bark the trees, and to collect the bark in buildings erected for the purpose. You may see them assemble round the largest of the bark trees, each provided with a knife and a bag, and thus prepared they slice down the bark, as high as they can reach, and then having bound a kind of ladder with tough fibres to the trunk, they ascend a few steps, and make the same incisions. A short time suffices to mount, in this manner, the highest trees. An Indian below gathers what the other cuts down, and this they do by turns, going from tree to tree, till each has filled his bag. The bark, thus collected, is removed as soon as possible from the receiving hut to the nearest farm house or plantation, where it is

spread abroad in the open air, and turned frequently to dry. A tree when stripped, is not re clothed with a new bark for at least eighteen or twenty years, and not even then, unless a strip, however narrow, is left from the root to the branches, through which the sap may ascend, and invigorate the plant.

Both history and tradition concur in stating that the use of this valuable bark as a remedy for fever, was known to the natives of Peru before the conquest of their country. But Spanish writers, who invariably endeavour to depreciate that unoffending and injured people, refuse them the credit of this discovery. They tell us that a lake near the town of Loxa was thickly shaded with bark trees, and that some of them having been blown into it by high winds, the waters became extremely bitter. That an Indian, parched with a raging fever, having gone to shelter himself beneath the trees, was forced by excessive thirst, to drink the waters, and that having drank of them, he rapidly recovered. The Indian hastened to tell his neighbours, and many, encouraged by his example, took the same healing draught, and were as speedily relieved. Upon this, seeking to discover what imparted such salutary virtues to this hitherto unheeded lake, they found that several bark trees had fallen into it. Subsequent experiments ascertained that the efficacy of the tree was principally confined to the bark, and as years passed on, it became an important article of commerce. Still for a considerable period this valuable discovery was chiefly confined to the town and neighbourhood of Loxa; and it was not till the beginning of the seventeenth century that the virtues of the Peruvian

bark were generally made known. At this time, a Spanish soldier, hearing that the vice-queen of Peru was suffering from an intermitting fever, which baffled the skill of her physicians, recommended it with success. It was then generally prescribed, and at length, De Lugo, a jesuit, and procuror-general of his order, brought it to Rome, where it was called the jesuit's bark, and sold throughout Europe for its weight in gold. Still, being made into a powder, the better to conceal its origin, this valuable medicine came into disuse, till Mr. Talbot, an English physician residing at Paris, performed with it so many cures, that Louis the Fourteenth rewarded him with five thousand crowns, and commanded the secret to be generally made known.

Many other vegetable productions of Peru and the Brazils afford either rich perfumes, or powerful restoratives. The balsam of capivi, and that of tolu, are also equally celebrated; the first for its strengthening virtues, the second for its fragrant scent and aromatic taste, and for its healing qualities in disorders of the lungs.

In the same regions is found, in large groups, the elegant Vicugna, a smaller and swifter animal than the llama, and producing wool of the finest quality. They frequently ascend nearly to the summit of the southern Andes, though preferring sheltered valleys, and the covert of those lofty trees, which produce an imposing effect when seen on the barren flanks of such high mountains as diversify the province of Quito. The vicuñas are generally taken by being driven down the hills into the narrow passes of the valleys, across which feathered ropes have previously

been stretched. When arrived within sight of the unusual object, the whole herd instinctively stop, terrified by the fluttering of the feathers, afraid to turn back, and unable to proceed, and are either shot, or noosed by the lasso; they are even so timid, as often to be taken by the hand. But if an alpaca is among them, he, nothing moved by the fluttering of the feathers, dashes through the barrier, and all the rest, being encouraged by his example, boldly follow.

'Cochineal insects are found in great abundance throughout various provinces of Peru; in that of Hambuto especially. They are mostly gathered from the branches of the nopal tree, and form an important article of commerce; being highly estimated in every part of the civilized world, on account of the incomparable beauty which they impart to silk and wool, to linen and cotton. The care of these valuable insects is a chief employment of the Indians, both in Peru and New Spain, whereas in other parts, they increase rapidly, without the slightest attention, and when gathered, are called *grana sylvestris*, or wild cochineal, a kind well known in England by the name of cochineal mestique. Loja also produces some of the finest quality, but the inhabitants are not careful to collect more than suffices for the dyers in that, and the neighbouring jurisdiction of Cuenca. Hence the carpets of Loja, and the baize of Cuenca, are purchased at high prices, and preferred to all others, on account of the beauty of their colours. Different species of the cochineal abound on the nopal trees, and though the wild are less distinguished for bril-

liancy of colour than the cultivated, it is merely owing to want of care. The Indians in many parts where they are most abundant, entirely neglect them, either because they are unable to dispose of them, or from the apprehension that their labours may be destroyed by sudden storms.

The Nopal, or *Cactus grandiflora*, the favourite resort of the cochineal insect, is one of the most magnificent productions of the vegetable world. It begins to open about seven in the evening, and flowers through the night, shedding a delicious fragrance, and offering its brimming goblet, filled with nectareous juice, to such butterflies and insects as are then abroad. When the moon shines bright, you may see its splendid yellow calyx, at least a foot in diameter, thick set with pure white petals, and numerous recurved stamens surrounding the style which rises in the centre, like a polished shaft, thrown out in high relief from amid the deep dark foliage of intermingling leaves and branches.

This splendid flower produces an oval-shaped fruit, filled with small seeds, and of a grateful acid. It is somewhat larger than a full-sized egg, and is covered with bright yellow scales. Light, which appears so essential to plants in general, seems unnecessary to the magnificent and sweetly-scented cactus, both as regards the flower and the fruit; the dews of night suffice to yield it moisture, and the barest rock serves as a basement for its roots. It belongs to a tribe of succulent plants which are assigned by their Creator to the hottest portions of the globe, though found occasionally towards the north, and which principally derive their nourish-

ment from the moisture of the atmosphere, and the very little that is afforded by the earth from which they spring. Saussure informs us that he once preserved the branch of a species of cactus for fourteen months in a dark cupboard without either earth or water, during which time the quicksilver fell nearly seventeen degrees below the freezing point, while in summer the heat was equal to seventy-eight degrees. The branch had not, when gathered from its parent stem, been conveyed in full strength and vigour to the place of destination; it had previously been subjected for at least three weeks to numerous experiments, both in the sun and shade. At length the cactus shrivelled up, and lost its juices, but during the period of seclusion it threw out roots and branches over its whole surface; and not one portion was deprived of its vegetative power.

The cactus, in common with all succulent plants, of which the unassuming houseleek offers a familiar example, beautifully exemplifies that mighty power which often causes regions naturally most unfavourable to vegetation to be covered with shrubs and flowers. In countries parched with excessive heat, and in places where few other plants would grow, these plants often withstand the beams of a fervid sun; they are provided for the purpose with large vessels for absorbing moisture, and consequently flourish on parched rocks, and in sandy deserts.

The tribe of which the cactus is a member, is curious and fantastic. Its numerous varieties rise abruptly from out the ground; they have neither leaves nor branches, and the stems are developed in the most varied and eccentric manner. Yet the

flowers are splendid, and astonish the passer-by with their gorgeous tints, and the magnificent unfolding of their petals. They often grow to a great size in sandy deserts, where no cool showers refresh the burning soil, where no streams are heard, and where the heated sand is intolerable even to the camel's foot. Yet there the melon cactus presents a cool and copious draught to the fainting traveller, and has often saved him from a lingering and painful death. It grows in the deserts of the East, and of Sahara, of the Pampas also, and in places where no other vegetable could exist. Travellers from the parched plains of Cumana and New Barcelona, speak of some gigantic species, at least thirty feet in height, whose upright and angular stems, if such they may be called, appear in the distance like massive columns. But still more striking is their effect when seen at sunset. The brilliant glow of the horizon then imparts a corresponding hue to the huge vegetable masses which cast a lengthened shadow on the ground, and he who had never witnessed such a spectacle might readily imagine that he saw before him fluted columns and massy pillars, with huge blocks of stone, and magnificent standing candelabra, which seemed destined in by-gone days to light up some hall of state.

Were it possible to embrace in one comprehensive glance the mighty range of the vast Cordilleras, what an exquisite variety of shrubs and trees, of herbs and flowers, would be everywhere conspicuous; of animals too, for the creatures concerning which I have just spoken, the llama, and vicugna, the guanaco, and alpaca, with numerous others of differ-

ent forms and instincts, range far up its stupendous sides. Various also are the degrees of temperature in different localities, as they are either screened from the wind, or exposed to its power, or according to the aspect and nature of the soil. We may briefly notice Quixos and Macas as affording interesting proofs of this peculiarity. Though both lying on the eastern side of the Cordilleras, they are widely different with regard to climate. The first is hot and moist, subject to almost continual rains, and covered in many parts with noble forests, while beautiful groups of cinnamon trees are seen in sheltered and sunny places, the flowers of which surpass even those of Ceylon, and fill the air with fragrance. Macas is dissimilar both in its temperature and seasons; for though it is also finely wooded, and covered with luxuriant vegetation, the air is clear and dry. Those who delight in flowers, and fine weather, and desire to avoid even the semblance of cold weather, might obtain their wish by changing from Quixos to Macas. In the former, winter commences in April, and lasts till September; while in the latter, September is the most delightful month in the whole year, and cool and refreshing breezes descending from the snowy mountains over which they have passed, temper the heat of the sun-beam. The air is then clear, and the sky serene, and the earth is clothed with grass and flowers, while the inhabitants, gladdened with such pleasing objects, rejoice that the storms of winter have passed by. Botanists report that few countries are more rich in vegetable productions. Tobacco grows plentifully in sheltered places; that unfragrant herb

is cultivated to such an extent as to supply the consumption of Peru and Quito, with that of Chili. After steeping the plant in hot mead or a decoction of sweet herbs, in order to improve its flavour, and the better to preserve its strength, it is dried, and tied up in rolls, containing an hundred leaves. No other is used by the inhabitants of the neighbouring countries, who prefer it when thus prepared. Sugar canes and cotton also thrive well in Macas. But the dread of the wild Indians, who commit fearful depredations, discourages the country people from planting more than just suffices for present consumption. It happens not unfrequently that when the peasant is working cheerfully, with his wife and children, he is suddenly assailed, and the products of his labour are in a moment carried off.

Among the variety of valuable trees that diversify the woods of Macas, one of the most remarkable is the Storax, (*Styrax officinale*.) of which the gum is exquisitely fragrant. But it is rarely to be obtained, as the trees grow in lonely places near the haunts of the wild Indians. Cinnamon trees also flourish in great abundance. The bark they yield is said to be even superior to that of Ceylon, and though widely different from such as is produced at Quixos, the superiority is merely owing to their being fully exposed to the sunbeams, as they grow unshaded, and the richness of the ground is not drawn from them by the roots of other trees. This mode of treatment answers extremely well, as was shown by the exceeding beauty of a solitary tree, noticed by Ulloa, near the town of Macas, the bark and blossom of which exceeded in taste and fragrance, and aromatic

power, the richest cinnamon of the East. Great quantities of copal and wild wax are also brought from Macas, but the latter is of little value.

It would not readily be imagined that the province of Quito, situated in the centre of the torrid zone, and immediately beneath the line, could be, in climate, a privileged and happy land: where in some parts the natives not only rejoice in the mildness of the atmosphere, but even suffer occasionally from the cold; while in others they walk through meadows covered all the year with verdure, and enamelled with beautiful flowers.

Various circumstances concur in producing these effects, and by the combination of them, the heat is mitigated, and the country rendered habitable. First of these, is the elevation of this portion of America, which, rising high above the sea and land, is less heated by the action of the sunbeams, and is constantly played over by cool and refreshing breezes. Stupendous mountains also intersect the country in many parts, covered with snow that never melts; volcanoes, too, flaming within, but having their summits and deeply riven sides involved in ice. Hence, it happens that the plains are temperate, the valleys warm, and the mountainous regions even cold, and that according to the situation of different places is the gradation and variety of temperature, between cold and heat.

Quito possesses a happy medium. There neither heat nor cold predominates, though the extremes of both are felt at a short distance. The morning is generally pleasant, the day warm, and the nights of an agreeable coolness; the seasons go hand in hand,

and little difference is perceptible between them. Hence the inhabitants seldom vary their dress throughout the year, while the healthy winds that blow continually, and most generally from north to south, preserve the country from being parched by the rays of a fervid sun. Noxious insects are consequently very rare. Mosquitoes, which are so intolerable in many of the warmer portions of the globe, are entirely unknown, nor are any venomous reptiles seen even during the rainy season. Thus is Quito, though lying beneath the line, and exposed by its situation to a degree of heat even greater than that which parches up the deserts of Arabia, rendered not only habitable, but even pleasant: a benign abode for civilized men, and covered with luxuriant vegetation. Fruits and flowers grow there in great abundance, and the extremes of heat and cold, are so happily determined, that the moisture of the earth, instead of being dried up, is rendered conducive to the support of vegetable life, while such little difference is perceptible throughout the year, that the various productions of the seasons are blended in gay profusion. The European, therefore, who speaks of spring and summer, of autumn and of winter, as distinct from one another, observes, with admiration, that while one plant is fading, another of the same kind is springing up; that while some flowers are going to seed, others of equal beauty are beginning to expand; that, further, while rich fruits are waiting only to be gathered, and leaves to change their colour, fresh leaves spring forth, and flowers open, and even fruits begin to ripen on the same tree. Similar gradations are equally conspicuous in

the growth of corn. In one field where the business of husbandry is going on, the grain is being cast into the earth, and watchers take their stations to chase away the birds. Beside that field, or divided only by a slender fence, the corn which has been recently sown, is in the blade, and the more advanced begins to blossom; in another the corn stands thick and rustles in the breeze, and the reaper is putting in his sickle. And thus it often happens that the declivity of a gently sloping hill, exhibits all the beauties of the season at a single view. This also occurs on a large scale throughout the country, for although there is in general a settled time for the great harvest, yet it frequently occurs that the most favourable season for sowing in one place is a month later than that in another, at the distance even of one or two leagues; and that further still, the time in another is not yet arrived. This variety is occasioned by different aspects, or by exposure to different degrees of heat or shade, or on the sloping sides of sunny mountains. Yet Quito has its scourges, for without them it would be a paradise, and men require to be constantly reminded that this fair earth has experienced a terrible revulsion. Furious tempests of thunder and lightning frequently occur, and the still more terrific phenomena of subterraneous thunder.

The Sugar Cane and Cotton are both cultivated in great perfection throughout Quito.

The Sugar Cane (*Saccharum officinarum*) is an elegant and jointed reed, rising occasionally to the

height of seven feet. When in full blossom its appearance is beautiful, and when growing to a considerable extent, it presents a striking feature in transatlantic scenery. It is, when ripe, of a bright and golden yellow; streaked occasionally with red; the top is of a darkish green, and when perfectly dry, either from drought or ripeness, it turns to a russet yellow. Long and narrow leaves gracefully depend on either side, from the centre of which shoots up a shaft resembling a silver wand, from two to six feet in height, and surmounted with a plume of white feathers, delicately tinged with lilac. Such is the beautiful *saccharum*, to the juice of which we are so much indebted. It is undoubtedly a native of America, and the West India islands; though the art of refining sugar was first made known to the Europeans by a Venetian, who is said to have received one hundred thousand crowns for the discovery. This discovery was made before the new world was explored, but whether the art of refining sugar was original with the Venetian, or whether it was conveyed from China, where it had been long practised, cannot now be ascertained. Certain it is that the prevailing opinion respecting the sugar cane having been first brought from China into Sicily, and thence to Spain, to the Madeiras, the Canary, and Cape de Verd islands; and having been carried afterwards by adventurers to America, is without foundation. Labat has proved beyond all contradiction, and the learned Lafitau pronounced his reasoning incontrovertible, that sugar canes are the natural productions of America. For in addition to the evidence of Francis Ximenes, who, in a treatise

on American plants, published at Mexico, asserts that the saccharum grows without cultivation, and to an extraordinary size, on the banks of the river Plata; we are assured by Jean de Lery, a Protestant minister, and chaplain to the Dutch garrison at Fort Coligny, on the river Janeiro, during the sixteenth century, that he found sugar canes in great



THE SUGAR CANE.

abundance beside the banks of that river, and in places never visited by the Portuguese. Father Hennepin, and other voyagers, bear testimony in

like manner to their growth near the mouth of the Mississippi, and Jean de Laet, to their spontaneous production in the island of St. Vincent. It is not for the plant, therefore, but for the art of refining sugar, that the West Indies are indebted to the Spaniards and Portuguese, and these to the nations of the East.

The canes, when fully ripe, are cut down nearly to the root, and being then divided into convenient lengths and made into bundles, are conveyed to the mill. The expressed juice, which is obtained by passing the canes twice through the cylinders of the mill, is received into a cistern, and exposed to the action of heat, in order to prevent it from becoming acid. A certain quantity of lime or lime-water is then added, to promote the separation of the grosser particles contained in the juice, and the liquor is subjected to a rapid boiling, in order to evaporate the watery particles, and to bring the syrup to such a consistency as to granulate in cooling. When the liquor is sufficiently cooled in shallow trays, it is put into hogsheads, the bottoms of which are perforated; these hogsheads are then placed over a large cistern, into which that portion of saccharine matter called molasses, rapidly drains, and leaves the raw sugar in the state in which it reaches us. The casks are afterwards filled up, headed, and sent on board the vessels. Rum is the produce of molasses; of the saccharine matter that will not crystallize, as well as of the impurities which collect upon the surface of the boiling liquor.

We regard sugar as a pleasant addition to the tea table, as a means of preserving the juice and sub-

stance of fruits in all countries, and at all seasons, as affording a delicious seasoning to many kinds of food; but we are not so generally aware that it is capable of yielding the most incongruous substances. Yet such is the fact. It is both phosphoric and combustible, emitting, when exposed to the action of a slow fire, a blue flame, and a white one in proportion to the degree of heat. It produces, by distillation, a quantity of acid and oil, of gas and charcoal. When subjected to the action of nitrous acid, oxalic acid is readily produced; and Lavoisier, who paid much attention to the subject, assigned three principles in sugar, hydrogen, oxygen, and carbon. The expressed juice, if left to itself, passes into the acetous fermentation, and yields, when decomposed, after the lapse of two or three months, a considerable quantity of glutinous matter. This matter, when distilled, gives a portion of ammonia, and if the juice be exposed to the spirituous fermentation, a wine is obtained analogous to cider. This also, after being kept in bottles for some months, and then distilled, yields a portion of brandy.

Who that observed a field of sugar canes, lifting up their graceful plumes of white feathers, and waving their long narrow leaves, as if to welcome the soft summer breeze, would conjecture that they contained within them, laid up as in a store-house, such heterogeneous materials, each of which are only waiting to be called forth by the skill of man,—that oil and acid, a gas, and charcoal, ammonia, and wine, are all contained in this jointed reed; sugar also, that pleasant substance to which we are indebted for many valuable and important results;

and especially for yielding a greater quantity of nourishment in a given quantity of matter, than can be obtained from any other with which we are acquainted ?

This fact is well known to the Indians, who carry it with them in their excursions from home. When unable to obtain cane-sugar, they mix a certain quantity of such as they collect from the maple, with an equal quantity of dried and powdered Indian corn, in its milky state. This mixture is packed in little baskets, which are frequently wetted in travelling, without injuring the sugar ; and a few spoonfuls mixed with half a pint of spring water, affords a pleasant and invigorating meal. From the degree of strength which is thus imparted by a small quantity of sugar, it might probably be given with much advantage to horses, in places and under circumstances which make it difficult to obtain for them their natural food. Certain it is, that a pound of sugar, mixed with grass, or hay, has supported the strength and spirits of a horse, through a day's labour, in one of the West India islands : and that a larger quantity given alone, fattened both horses and cattle, in Hispaniola, for a period of several months, when, during war time, the exportation of sugar and the importation of grain were prevented, from the want of ships. Sugar also is beneficial as a medicine, and hence a love for this aliment is implanted in young children, as if to save them from many juvenile disorders. Dr. Rush knew a gentleman in Philadelphia, who early adopted this opinion, and who, by indulging a large family in the use of sugar preserved them from complaints, to which

their neighbours of the same age were liable. Sir John Pringle remarked, that the plague has never been known in any country where sugar composes a material part in the diet of the inhabitants.

Sugar, then, is valuable both as food and medicine. It is a pleasant gift for the use of man, and while the symmetry and beauty of the jointed reed delights the eye, the saccharine matter which it yields, is highly grateful to the taste. We have also to notice another goodly gift of the Creator to mankind. This is the Cotton Tree, whose soft downy substance is manufactured into quilts and tapestry, waistcoats and curtains, into muslin, and various kinds of clothing. Occasionally, it is mixed with wool, sometimes with silk, and even with gold itself. Naturalists mention several species of the cotton plant, that are found in almost every soil and situation. Humboldt states, that the larger species, which attain to the magnitude of trees, require a mean annual temperature of 68° Fahrenheit, while the shrubby kind may be cultivated with success, under a mean temperature of from sixty to sixty-four degrees.

Beautiful is the appearance of a cotton plantation, in favourable seasons, and when the cotton is fully ripe. The glossy dark green leaves of the plant are finely contrasted with the full white cottony globes which are profusely scattered among the branches, and which often suddenly appear, as if hung on high by an invisible hand. This effect is produced by the spontaneous bursting of the capsule, and the consequent appearance of its snowy contents. Those who are employed to collect the

Pods, go forth to their labours early in the morning, before the sun has risen, lest exposure to its beams should injure the delicate whiteness of the cotton. :



THE COTTON PLANT.

One species distinguished by the name of *Gossypium religiosum*, is generally cultivated in the Mauritius. Of this there are two varieties: in one the cotton is extremely white; in the other, of a yellowish brown, and from this the stuff called nankeen is made. We may therefore presume that the *religiosum* is a native of China, whence nankeens are generally obtained. But the *Gossypium her-*

baceum, or common herbaceous cotton plant, is most generally cultivated; and this divides itself into annual and perennial plants. The first is herbaceous, and rarely attains to more than eighteen or twenty inches in height. The pods, when fully ripe, open simultaneously, and exhibit to view the fleecy cotton, in which the seeds are securely bedded. At this season, the effect is extremely pleasing when seen from a rising ground. A bed of waving verdure extends on either side, relieved with large yellow flowers, having each a purple centre, while here and there, tufts of white are seen amid the foliage. The next day, or after the lapse of a few hours, or even while the spectator is looking on, suddenly every bush and branch appears as if covered with balls of the purest white, waving in the breeze, which not unfrequently carries with it a tuft of cotton, as if in triumph. This common herbaceous plant is sown, and reaped, like corn; the time of gathering, in hot countries, occurs twice during the year, in colder climates only once; that which is imported into England from Georgia, and is called the sea-island cotton, bears a double price to that of any other country. The perennial plants which have been left to grow, rise far above the annual in height and size: they frequently attain to a considerable elevation, and both at the time of flowering, and when the pods are fully ripe, produce a remarkable effect.

The *Jatropha manihot*, bitter cassada, or manioc, also grows profusely in Quito, as well as generally throughout South America, and has been long cultivated in the West Indies for the sake of its nutri-

tious qualities. Yet the *jatropha* yields a deadly poison, and by means of its deleterious juice, the Indians destroyed many of their Spanish persecutors. Indeed so active is its agency as to occasion death in a few minutes. Yet no effect is externally produced, the poison acts solely upon the nervous system, and shrinks the stomach to half its natural size. It has, therefore, been inferred, that the volatile substance in which the fatal principle resides, directs its activity to the nervous web which envelopes the whole body, and especially over the coatings of the stomach, which by its shrinking plainly indicates the nature of the poison that has so fearfully assailed it.

Who, then, that saw the manioc growing in its native soil, and who, regarding it with a botanic eye, knew that it belonged to a family of deleterious plants, would not turn from the examination of the living specimen, lest he should accidentally imbibe its poison? But circumstances with which we are unacquainted, first led the natives of the country to dissipate its noxious qualities, by the active agency of heat. Chance, perhaps, or rather, we should say, the merciful Creator of the manioc, inclined the hearts of those beside whose doors it grew, to apply the virtues of the plants to purposes equally salutary and beneficial. He made them know, most probably, by means which men call accidental, that the subtle nature of vegetable poisons is readily overcome, and that their activity and fatal powers are liable to vanish at the approach of fire. Nor is this peculiar to the manioc. The leaves of the taro growing in the islands of the South Sea, are extremely poisonous :

they resemble the acrid "lords and ladies" of our hedges, but when dressed, they form an wholesome and nutritious vegetable. Laurel leaves contain a poisonous juice, yet they are used occasionally in different kinds of cooking; and while baking, the heat dissipates the noxious principle, and leaves the harmless one behind. Art and perseverance, therefore, has prepared from the fatal manioc, an wholesome and nutritious food.

The massive root is first reduced by grating to fine meal, and the process which succeeds is very similar to that pursued by us in reference to wheat; the meal is pressed and dried, which corresponds to the drying and threshing of corn. It is then beaten fine in a mortar, and sifted, to separate the bran from the flour; these also resemble, in their operation and effects, the winnowing and the grinding, and the dressing of wheat. But here the analogy ends, and the course of preparation terminates: for the natives are unacquainted with the process of leaven. But instead of this they retain a sufficient quantity of moisture to produce a mutual adhesion of the particles, and which, when heated, acts as a cement in binding the meal together; the shape first given to the cakes in kneading, is thus preserved, and when thoroughly baked, they are called cassava cakes.

These cakes are sold in the markets, and are highly esteemed for their nutritious qualities. The Spaniards found them in general use among the natives, who called them carzabbi, and preferred them to every other kind of diet, on account of the ease with which they were digested, and the facility

of cultivation in the manioc. Those who prepare the meal are aware of its pernicious qualities, and take the most efficacious method to expel them, by drying and baking the pounded root.

Beautifully has it been observed by one of the most elegant and philosophic of the Latin poets, that the discouragements which often thwart the labours of the husbandman may be ascribed to the appointment of heaven, in order to excite his vigilance, and quicken his faculties, lest drowsiness should overspread the minds, and dulness foil the active instruments of thought. The subtle poison which exists in the manioc root, calls equally for the exercise of skill, of labour, and of patience; it affords too, an impressive instance, that good and evil are often mysteriously blended in the occurrences of life, and that he who is truly wise, will thankfully apply himself to enjoy the one, and to neutralize the other. In our present state of being, were all things ministered to us spontaneously, without the necessity of taking thought concerning them, many of the arts and sciences would be laid aside, and there would be no practical difference between the man who thankfully applies the gifts which his Maker has assigned him, and the one who regards them not.

The forty-fourth and fifty-third degree of north latitude, including the vicinity of the great lakes, with the whole extent of Canada and New Brunswick, restrain within their limits, as if by some mighty spell, the Moose, or Black Elk, (*Cervus alces*,) which has also his assigned locality in Europe, and in Asia. He is a bold and fearless ranger, who has never bent his towering neck to the yoke of

man, and who, when seen in all the glory of his full-grown horns amid the scenery of his own wilderness, is one of the most magnificent animals in nature.



THE BLACK ELK.

A specimen was observed by Dr. James and his party, under circumstances of peculiar interest. In proceeding up the Rocky Mountains, they experienced much difficulty, and underwent considerable labour in scaling the steep ascents; some hazard, also, in descending the precipitous declivities which marked their course. The timber was small, and sprung from out the fissures of the rocks, and many of the solitary pines which grew far up the mountain, had evidently been the sport of furious tem-

pests; they were riven and seamed by lightning, and, often being torn from off their place of growth, they hung suspended high above the travellers' path. Having at length toiled up a weary ascent, the party observed on a projecting ledge of the succeeding mountain two elks, grazing on the scanty herbage which grew there. They seemed at a short distance, and in consequence of that illusion which is common in hilly countries, they appeared of a vast size. The party were surprised at the heedlessness of these fine creatures, which remained feeding tranquilly, while they clambered along the rock in full view. But in a moment the noble elks were gone, they bounded majestically off, and left the authors of their alarm in silent astonishment, at the headlong course which they fearlessly pursued. The view from this elevated spot was magnificent. To the right, and easy of access, a bold projecting rock upheld a solitary cedar; while the huge rampart of naked rock, which had been seen from beneath to stretch across the valley, presented a magnificent barrier to the view; round the extreme verge of which the river whirled, and flashed, and sparkled in the sunbeams. To the east extended the vast prairie over which the travellers had so long pursued their toilsome and gradually ascending way; but the undulations which swelled its surface disappeared, and the whole lay like a map before them. While surveying the mighty landscape, one moving object occasionally became visible, by reflecting the rays of the setting sun. This object was a white flag, waving in the gentle breeze, and making known the place of the travellers' camp: the only spot in the boundless

landscape, on which the eye could rest as the work of human hands.

Turning from the grand and terrible in nature to consider the formation of a creature which seems so entirely in unison with them, we are struck with the peculiar swelling out, and projection of the nostrils, which are divided by a long slit. by the largeness of the ears, together with the shortness of the neck, and the disproportionate height of the legs. This mode of structure, so different from that of the llama and vicugna, the bison or the marmot, has no doubt a peculiar reference to the kind of life for which the moose-deer is designed. The largeness of his ears, and the facility with which he turns them, enables him readily to discover even the noiseless tread of hostile feet, and hence it is that even during the most furious storms, when wind and thunder and the crash of uprooting trees are mingled in one tremendous roar, it is impossible to come upon the moose-deer unperceived. If an Indian steals through the forest, unheard as he imagines amid the fury of the tempest, if either his foot or hand breaks the smallest twig, in a moment, the creature lifts up his head, and listens, and if he does not immediately cease eating, he is evidently alert, and ready to bound off. And even if the Indian hunter, aware of this peculiarity, neither moves nor makes the slightest sound for a considerable time, in order that the animal may forget to listen, still he does not feel secure, but continues to turn his head, and to look towards the part of the forest from whence the sound proceeded, and he is for many hours more vigilant than before. The swelling

out and projection of the nostrils is a peculiar characteristic of the species, as well as the slit by which they are divided; they have possibly some reference to the long and flexible upper lip, and its four pair of strong muscles, by the aid of which the animal is enabled to make movements equally various and rapid. He is thus undoubtedly enabled to select his food, and possibly to remain for a considerable time beneath the water. Indians say that in order to preserve himself from the flies, which annoy him during the summer months, he seeks the marshes, and will often remain both night and day, feeding upon water plants, and only raising his head occasionally above the surface. Hence the advantage which he derives from the extraordinary height to which his body is lifted above the ground, and hence also he does not require that long and graceful neck which distinguishes several species of deer. Certain it is that he frequents the water, and it has even been related by persons deserving of credit, that the moose often owes his preservation to the faculty of remaining for a considerable time beneath it. We derive from Tanner's Narrative the curious fact, that two Indian hunters having chased one of these swift animals into a small pond, waited until evening, expecting every moment that he would emerge from the centre of it, and make for the shore. But in vain they watched and waited, for no bubble on the surface of the water indicated that there was life beneath. At length, supposing him to be either drowned, or to have eluded their vigilance, they abandoned all hope of taking him, and returned home. Not long after,

came a solitary hunter, loaded with meat, who told them that, having followed the track of a moose for some distance, he had traced it to the margin of the pond, but that having also discovered the foot steps of two men made at the same time, he concluded that the creature had been killed. Wearied with the labour of the day, he sat down to rest beside the pond, and looking over its surface to the dense and dark forest on the opposite margin, he saw a moose rise slowly from the centre of the pond, and make towards the shore. In a moment his gun was ready, and the animal fell. The Indian further added that he considered the moose to be much shyer and more difficult to take than any other animal, being extremely vigilant, and having his senses more acute than either the buffalo or caribou; being also fleeter than the elk, and more prudent and crafty than the antelope.

Three varieties of the North American rein-deer, or Caribou, inhabit very different localities. The first is known among the Canadian voyageurs as the *caribou des bois*, or wood rein-deer; the second gives animation to the dreary regions of the Rocky Mountains in central North America, and is supposed to be the mule-deer of Lewis and Clark; the third, and smallest, inhabits the islands of the Polar Sea, Greenland, and the cold and pitiless shores of Labrador. They differ from their brethren of the ancient world, by having shorter, less concave, and stronger antlers; with these they are said to remove the snow when in quest of food. Untameable as the wilds which they inhabit, none of the aborigines have yet learned to domesticate them.

America has also her native stags. Those of Canada reside in deep forests, and on rocky mountains; they are not unfrequent about the Kaatskill, that dismembered branch of the Appalachian mountains, which whoever has made a voyage upon the Hudson must remember to have seen westward of the river, rising to a noble height above the surrounding country. Beautiful is that mountain branch, and the naturalist who wishes to impress upon his readers the haunts of different tribes and families of either plants or animals, may be allowed to repeat "that every change of season, every change of weather, indeed every hour of the day, produces some alteration in the hues and forms of those magnificent mountains, and that the fleet animals which often glance as if in transport up their rocky sides, seem to partake of all these beautiful hues, and shifting tints, till a looker-on would almost fancy that they were creatures

Which in the colours of the rainbow live.

When the weather is fair and settled, the Kaatskills are clothed in varying hues of blue and purple, and print their bold outlines on the clear evening sky; but sometimes when the rest of the landscape is cloudless, they will gather a hood of gray vapours about their summits, which, in the last rays of the setting sun, glow and light up like a crown of glory."

Wapiti are found among less romantic scenes, in the wild savannas of the interior, and on the utmost western limits of North America beyond the Rocky Mountains. The Virginian, of the Mazamine group,

is confined to the vast regions whence his name is derived; the Mexican inhabits the ancient kingdom of Montezuma; the Great-Eared is found in the most remote north-western territories of the United States; the Fuco dwells in the swampy parts of



THE WAPITI, (*Cervus Canadensis*.)

South America, those especially of Paraguay, covered with shrubs and bushes, and abounding with the zinziber, or ginger; the Guazuli prefers the open plains; the Cariacou, smallest of the species, a variety of the Virginian deer, exists principally in the woody portions of tropical America, and as far north as the southern regions of the United States. The Pita, Apara, and Bira have each their separate localities. The first resides in the deep forests that shade the level parts of eastern South America, along the bay

of Honduras, celebrated for its fine mahogany trees; they live in herds and appear to be the only gregarious animals that do not prefer the plain; the second is found on the upland and more open grounds; the third dwells alone in the solitary woods of Brazil.

An American naturalist states that deer are far more abundant than at the first settlement of the country. They increase to a certain extent with the population, and the reason may be readily assigned; they find protection in the neighbourhood of man from the beasts of prey that assail them in the wilderness, and from whose attacks their young can with difficulty escape. Wolves are their greatest enemies; these creatures hunt in packs, like hounds, and seldom give up the chase until the prey be taken. "We have often sat," said the naturalist, "on a moonlight summer night, at the door of our log cabin, on the wide expanse of the lone prairie, and heard the wolves in full chase of a deer, which they pursued with loud yells. Sometimes the cry sounded from afar, over the wild plain, then it would die away, and again be distinguished at a nearer point, and in another direction; now the full cry would burst upon us from a neighbouring thicket, and we fancied that we could hear the panting of the exhausted deer, and again it was borne away and lost in the distance. We have spent whole nights in listening to such sounds, and once we saw a deer dash through the yard; he was followed by his audacious pursuers, who scoured after him, and passed within a few yards of the door at which we sat."

Deer frequent the salt-licks, those spots where the earth is impregnated with saline particles, or where the salt water oozes through the soil, and thither the hunter frequently repairs in quest of them. Secreting himself in some bush, or among the branches of a tree, he patiently awaits the coming of the deer, who arrive in company with other grazing animals, and pass unsuspectingly within reach of his rifle. This practice is pursued only in the summer, or early in the autumn; in cloudless nights, when the moon shines brilliantly, and when the open country is nearly as light as day. Indian hunters relate that when the pastures are green, wild deer rise from their lairs precisely at the moment of the moon's appearing on the horizon, whether in the night or day. This hour is, therefore, kept in view by the hunter as he journeys through the forest towards the salt-lick, which he is anxious to reach before the rising of the moon. The lick is generally an isolated spot, covered with short herbage, and bare of timber, yet belted round with a dark forest. On this favoured spot the moon shines bright, and firm and well strung must be the nerves of the hunter who does not find a strange feeling of awe and loneliness steal over him as he looks from out his leafy covert on that bright spot, and sees the massy trunks of aged trees gathered around it like guardians of the place, while darkness, deep and still as that of midnight, is beyond them. But the silence is soon broken by the sound of footsteps coming through the forest, and a crowd of grazing animals are seen emerging from the gloom into the moonshine. The most fearless

advance towards the licks, and, if undisturbed, continue for some hours, licking at intervals the earth, or lapping the salt water as it oozes from the soil. But the deer is a prudent animal, and often stops, looking cautiously around, and snuffing the air; he then advances a few steps, and stops again, smells the ground, or raises his expanded nostrils, as if he scented the approach of danger in every breeze. Meanwhile, the hunter sits motionless, and almost breathless, waiting till one of the fine animals gets within rifle-shot, and until its position in relation to the hunter and the light shall be favourable, when he fires with an unerring aim. A moment, and on that one bright spot, covered with noble creatures, not an animal remains. They rush headlong into the dark forest, crushing the canes and under-wood in their rapid flight, and the clear cold moon shines only on the hunter and the fallen deer.

The Dicranocerine Race of deer are exclusively American, and are confined to the northern latitudes. They are a swift and fearless race, forming small communities upon the hills that sweep around the base of the higher mountains, and above the lowlands on the banks of the Upper Missouri, and around Hudson's Bay; probably also to the extreme verge of the north-western coast of Nootka Sound, and Behring's Straits. They who traverse these regions often fall in with parties of Indians engaged in their pursuit. On one occasion, the hunters selected a wild hill as the scene of their sport, which ascended gradually before them from the plain, though extremely precipitous on the near

side. Having driven the game cautiously forwards they formed a ring, and then advanced, gradually, urging the troop to the edge of the precipice. When arrived there, they burst into loud and repeated yells, which were echoed and re-echoed far and near, from every wood and cave in all that lonely region. The timid herd, frightened at the unusual clamour, knew not where to run, but rushing on sudden destruction, sprang tumultuously over the brink of the precipice, and were destroyed in their fall. Upwards of sixty cabree, as they are called by the Indians, were taken in this manner.

Two species belong to this group, the Palmated Antelope, *A. palmata*, which inhabits the bleak regions near the Frozen Ocean, whence the tribe extends as far as the Stony Mountains and the river Jaune; and the Prong-horned Antelope (*A. furcifer*), that affects the borders of the Missouri, the north-western territory of the United States, and the Great Plains of the Columbia; a creature swift of foot, and often seen to dart along the brink of terrific precipices without stopping or looking back.

Magnificent creature! so stately and bright,
 In the pride of thy spirit pursuing thy flight;
 For what hath the child of the desert to dread,
 Wafting up his own mountains that far-beaming head,
 Or borne like a whirlwind down on the vale?
 Hail! king of the wild and the beautiful, hail!
 Hail! creature superb, whom Nature hath borne
 O'er a hundred hill-tops since the mist of the morn;
 Whom the pilgrim, lone wandering o'er mountain and moor,
 As the vision glides by him, may almost adore;
 For the joy of the happy, the strength of the free,
 Are spread in a garment of beauty o'er thee.

Up, up, to yon cliff! like a king to his throne,
O'er the black silent forest piled lofty and lone;
A throne which the eagle is glad to resign
Unto footsteps so fleet and so fearless as thine.
There the bright heather springs up in love of thy breast:
Lo! the clouds in the depth of the sky are at rest;
And the race of the wild winds is o'er on the hill,
In the hush of the mountains ye antlers lie still;
Though your branches now toss in the storm of delight,
Like the arms of the pine on yon shelterless height,
One moment, thou bright apparition, delay,
Then melt o'er the crags, like the sun from the day.

WILSON.

This fine animal has been occasionally noticed amid scenes of peculiar interest. A traveller lately observed several of them feeding tranquilly among numerous ancient Indian tumuli, opposite St. Louis. They have been also noticed on the summit of that enormous mound which was occupied a few years since by the monks of La Trappe, though now so overgrown with bushes and weeds, and interlaced with vines and briars, that no accurate measurement can be taken of its dimensions.

The survey of these productions of human industry, these monuments without inscription, commemorating the existence of a people once numerous and powerful, but now no longer known or remembered, produces an indescribable feeling of sadness. As we stand upon these mouldering piles, we cannot but compare their aspect of decay with the freshness of that wide field of nature which we see reviving around us, their insignificance with the majestic and imperishable features of the landscape. We feel the nothingness, the transitory nature, of everything human; we are reminded of what has

been so often said of the pyramids of Egypt, and may, with equal propriety, be applied to all the works of man:—"These monuments must perish, but the grass that grows between their disjointed fragments shall be renewed from year to year."

Mounds of a similar description have been observed in the ancient kingdom of Montezuma, those colossal elevations which rise on the vast plain of Puebla, separated only from the valley of Mexico by a chain of volcanic mountains, extending from Popocatepetl towards the river Trio, and the Peak of Telapon. That fertile plain, although devoid of vegetation, excepting a few scattered aloes and gum-dragon trees, is rich in remembrances connected with the history of Mexico. Generations pass away, and even nations vanish from the earth, but Nature remains unchanged. The aloes and gum-dragon trees flourish as erst they flourished when the first layers of the Pyramids of Cholula rose from the earth, erected by the hands of forgotten men, and witnessed by a crowded population. The Pyramids arose in the neighbourhood of thronged cities, Tlascala, Huexocingo, and Cholula; they were used for purposes of worship, and as burial-places for priests and kings. They preserved, too, a remarkable tradition of the deluge; for, say the Indians, in ancient time, when the waters of a great inundation had retired, one of seven giants, who alone survived, and who was surnamed the Builder, or Xelhua, went to Cholula, where he constructed an artificial hill in commemoration of the mountain which had saved himself and his brethren. It was made of bricks, and would have risen high, but the gods saw

with anger this edifice, the summit of which was to reach the clouds. Irritated at his audacity, they launched fire against the pyramid; many of the workmen perished, and the work was discontinued.



PYRAMID OF CHOLULA.

An altar was subsequently erected on its summit by the chief of an idolatrous sect, who introduced the custom of tattooing by means of the thorns of the aloe. The pyramid was built of unburnt bricks, with four platforms of equal height, and having the sides placed exactly opposite the cardinal points of the compass. Its base was twice as large as that of the Great Pyramid of Egypt. All that now remains of this most ancient and celebrated monument, the Monte Hecho a Mano, or the mountain made by

the hand of man, is merely a stupendous mound, which presents the appearance of a natural hill covered with vegetation. In the distance rises the volcano of Orizaba, shrouded with snow, and around it lies a desolate plain, seven thousand feet above the level of the sea. The towns, too, of Ilascala, Huexocingo, and Cholula, once so populous and flourishing, the smallest of which was compared by Cortez to the best peopled cities of Spain, have dwindled away, and scarcely a trace remains of their former greatness.

These stupendous mounds are associated in the minds of travellers with the solitary aloes which grow beside them; peculiar, in many of their species, to South America, and such portions of North America as verge towards the Line. These plants yield profusely the juice that bears their name. The juice is obtained by making an incision in the leaves, from which it issues either spontaneously or by pressing, and becomes hardened when exposed to the sun. In smell it resembles myrrh, and when pounded it yields a golden-tinted powder, which ancient naturalists termed the gall of nature. It is well known for its balsamic qualities: the physicians of Egypt used the Asiatic species in embalming, when they desired to transmit to posterity the features of the dead. One of the most remarkable of the tribe is the giant aloe, the *Agave Americana*, which, strictly speaking, is not an aloe, though closely resembling the species whose name it bears. Tropical America is the native region of this noble plant. It also abounds in the dry and warm parts of Southern Europe, along the sandy shores of the

Mediterranean, and especially in dry districts on the confines of Portugal and Spain. Resembling in the distance a majestic candlestick, with successive branches, its smooth green flowering stem rises from the centre of a tuft of leaves, while the branches that bear the individual clusters bend downwards near the stem in double curves, and upwards near the flowers. The rind or epidermis is beautifully adapted to the local disadvantages of the soil and climate in which the Agave flourishes. This, in common with the covering assigned to the leaves and stem of other plants which grow in hot or dry places, powerfully resists the action of heat, and the whole plant is in consequence when young extremely juicy. The juice contains both alkali and oil, and hence the agave is used in many parts of the Spanish peninsula as a substitute for soap. Cattle are also fed on the sliced or bruised leaves, when the pastures are burnt up during the summer months.

Agaves abound especially in Mexico. They give a peculiar character to the landscape. Far as the eye can reach extend fields covered with agaves, planted in rows at the distance of fifty-eight inches from each other. These plants begin to yield their juice when the flower-bud is on the point of development, and as the plant is destroyed if the incision be made long before the appearance of the flower-bud, it is of great importance to ascertain the state of growth. The cultivator, therefore, goes regularly through his plantation, and notices the gradual approach to efflorescence, and, if in doubt, he applies to an aged Indian whose judgment from

long experience may be safely trusted. The central leaves are then cut with a sharp instrument, and the opening is insensibly enlarged, while above it the lateral leaves are made to bend like a canopy, by drawing them together at the extremities. Into the opening thus made, the sap vessels throw all the juice that would otherwise have circulated throughout the magnificent column and its superb embellishments, and thus is a vegetable fountain opened, which keeps running for some months, and from which the Indian draws a pleasant and nutritious liquor, at least three or four times a day. Each plant yields commonly, on an average, nearly eight pints in twenty-four hours, of which three are obtained at sunrise, two at mid-day, and three at six in the evening. A vigorous plant has been even known to yield about seven quarts, or four hundred and fifty-four cubic inches per day, during four or five months, which amounts to the enormous quantity of sixty-seven thousand, one hundred and thirty cubic inches, supplied by a plant scarcely five feet high. The juice is collected into skins, similar to the ancient bottles mentioned in Holy Writ, which being strung at the end of a long pole, are carried early in the morning from house to house, by men who are hired for the purpose, and whose daily visits are welcome as those of the milkmen in London.

The agaves are raised from offsets, which are annually renewed, and thus a constant succession is kept up. The appearance of the agave in its different stages of growth is very pleasing. One large field contains the offsets neatly planted in rows,

another thriving young plants, a third strong and full-grown ones; in this a company of men are occupied, some in making incisions in the leaves, others in holding their neat skin vessels to receive the juice, while a fourth field is filled with such plants as having become dry, are preserved for the sake of their strong fibres, which are either drawn into cordage, or used for plating mats, with which to cover wooden houses during summer: for the aloe yields not only an abundant supply of pleasant and refreshing juice, but also hemp and papyrus equal to that of Asia and Egypt. The paper on which the ancient Mexicans painted their hieroglyphics was made from the fibres of this interesting plant macerated in water, and disposed in layers like the papyrus and the mulberry of the South Sea Islands. M. Humboldt preserved several fragments of manuscripts, written on specimens made from the aloe; some of which equalled pasteboard in thickness, while others resembled the finest Chinese paper. The thread, too, which is obtained from the aloe, is known in England by the name of pite-thread, and is preferred by naturalists to every other for the purpose of fixing specimens, as it is not liable to twist.

Humboldt observes, that scarcely does the habitable globe exhibit a race of men, however uncivilized, who do not prepare some kind of liquor from the vegetable kingdom, while at the same time there are comparatively few who cultivate certain plants for this specific purpose. They mostly extract their beverage from such as constitute the basis of their food: witness the distilla-

tions that are made from wheat and sugar. But the new world affords an instance of men who not only procure liquor from the sugary substance of the maize, the manioc, and banana, and from the pulp of several species of mimosa, but who expressly cultivate the aloe, which yields a pleasant juice for daily refreshment, and also a vinous beverage, equally stomachic, strengthening, and nutritive. Throughout a vast extent of country, on the interior table-land in Puebla and Mexico, the eye reposes only on fields thick set with aloes. This plant, of a leathery and prickly leaf, has, in company with the *Cactus opuntia*, become wild since the sixteenth century, throughout the southern parts of Europe, in the Canary Islands, and on the coast of Africa.

Several species of the aloe afford secure citadels for small birds. I lately noticed one of this description in the Botanical Garden at Chelsea. It grew to a considerable height, with saucer-shaped leaves, rising in tiers one above the other. They looked as if especially designed for places of refuge, and to them small birds resort in order to build their nests. All who trust to them are safe; for neither the twining serpent nor wily monkey can attack the young, or seize the sitting bird.

The juicy aloe, concerning which I have just spoken, is peculiarly valuable in the region where it grows, which, lying generally beneath the torrid zone, is now deluged with excessive rain, and now scorched with burning heat. We find accordingly that Mexico is abundant in fruit rather than grain. There, as in Peru and the Brazils, grow pine-apples

and pomegranates, oranges, and lemons, cool and refreshing fruits; figs and citrons are also common; with cocoa-nuts yielding milk, and a variety of pleasant fruits of which the names alone have reached us. Sugar plantations may be further noticed as being numerous, especially towards the Gulf of Mexico, and throughout Guaxaco and Guatemala, and noble groups of logwood and mahogany shade the Bay of Campeachy and Honduras.

The logwood, *Hæmatoxylon campechianum*, though not exclusively American, is nowhere so abundant. It is a majestic tree, of which the timber is compact and firm, and susceptible of a fine polish; it yields a red colouring matter, freely and copiously, to alcohol.

The second, *Swietenia mahogani*, is even loftier and more umbrageous than the English oak. A single log weighs not unfrequently from six to seven tons; and when two centuries have passed, the living trunk expands to such a gigantic size, and throws out such massive branches, and casts the shadow of its shining green leaves over so wide an area, that beside it the noblest forest-trees would sink into insignificance. The difficulty of conveying the tree when felled, from its place of growth, often nearly inaccessible, is very great, and requires no small labour and contrivance. Parties go forth equipped for the work, with as much order and precision as if for hunting. These parties generally consist of about fifty men, headed by a chief, whose office it is to search the woods, and to find employment for his band. Hence it is necessary that he should be equally fearless and intelligent, swift of foot, and

of strength sufficient to cut his way through the thickly tangled underwood. The beginning of August is most favourable for the research, because at this season the leaves of the mahogany are uniformly of a yellowish hue, inclining to red, and may be readily discovered, even at a distance, amid the deep dark foliage of the forest. Winding his way, therefore, through the thickest of the wood, and cutting a pathway as he goes, the chief, or huntsman, climbs the tallest tree, and if unsuccessful, pushes forward to another, till he at length espies the mahogany standing singly or in groups. He then descends, and without either chart or compass, soon reaches the exact point at which he aims, and with equal precision traces back his steps to his expecting companions, who lose no time in accompanying him to the place of destination. They then proceed to fell a number of trees sufficient to find labour during the season, and when this is done, the next care is to open a communication by means of roads to the nearest river. The mahogany trees grow often on high and rocky places, or in the very depths of thickly tangled woods,—dense forest masses, through which strong men find it difficult to penetrate, even with the aid of hatchets to cut their way. But mahogany trees, when felled, must be removed; and for this purpose workmen are divided into companies. The most athletic commence by clearing away the underwood with cutlasses, to the extent of one hundred yards for each man per day. The larger trees are then cut down as even with the ground as possible, and if too hard for cutting, they are readily set on fire; trees of this description,

which offer resistance to the axe are often very valuable: such as the bullet-tree and iron-wood, the red-wood and sapodilla; but they are thrown aside as useless, unless growing near some creek or rivulet that intersects the road. They are then invaluable for the construction of bridges, which are frequently very large, and require to be made of strong materials in order to bear the ponderous loads that will soon have to pass over them. But the cutting away of underwood, and the removal of even lofty trees, is not the only labour that is requisite in making roads through the forest; the workmen still require the aid of pick-axes and sledge-hammers to break the huge masses of stone which impede the way, to level considerable risings in the ground, and to remove any remaining stumps that may embarrass the draught oxen. When the roads are thus completed, and the trees cut into logs for the purpose of removing them, which generally occupies the intermediate months from August till April and May in the ensuing year, both men and cattle are put in requisition, that not a moment may be lost.

The wagons on which the mahogany is placed are called trucks, and six of these are escorted by forty men. Each wagon requires seven pair of oxen and two drivers, while sixteen of the party are employed in cutting food for the cattle, and the other twelve in loading the carriages. As the same degree of heat which dries up the roads, and renders even the marshy places passable, presses greatly upon both men and cattle, the loading and carrying of the timber is performed in the night. Here, then, is a

scene for a poet to describe. Imagine a lonely forest, dark with the gloom of night, not even a fire-fly abroad, not a single star seen through the canopy of boughs, not a sound heard, except the rustling of the night breeze in the topmost branches, and the ceaseless murmur of the distant river, pressing on its way. Suddenly a bell is heard, and as suddenly lights are seen advancing from a number of huts which then become visible, and where but a few minutes before all was gloom and silence: now, by the glare of torches, are discovered the innumerable stems of tall forest trees, half in light, half in shade, with impenetrable gloom beyond them, surrounding a spacious area where men and cattle are employed, and where all is bustle and activity. The logs are being placed upon the wagons by means of temporary platforms, one end of which rests upon the earth, another upon the wagons; and by means of this expedient enormous logs of many tons weight are gradually pushed up. When the wagons are loaded a signal is given, and the cattle begin to draw. A looker-on might almost fancy that the ponderous loads would crush the rocks beneath them, so heavily do they begin to move, and so massy is the appearance which they present, as, guided by the glare of the pine torches, they are seen slowly proceeding through the forest; the men and cattle thrown out in strong relief, while the further end of the loads is dimly seen in the gathering gloom of the deserted forest. Wearily they go, and reach at length the river side before the sun is at its highest power. Here a very different scene ensues: the logs are shortly removed from the

wagons, and being marked with the owners' names, are thrown into the river, where they continue till the periodical rains commence at the end of May.



THE MAHOGANY TREE.

The rivers are soon swollen to a great height, and the enormous logs begin to float. Their course is followed by the band of workmen in flat-bottomed canoes, and they have often to disengage them from the branches of overhanging trees, until they are stopped after a voyage of two or three hundred miles by a boom placed near the mouth of the

river. The logs are then separated and formed into large rafts, in which state they are guided to the timber wharfs of the proprietors, where they are taken out of the water, and such parts as were split or rent in being dashed by the current against the rocks are sawed off; and the mahogany when thus prepared is ready for shipping.

Those deep forests, where grow the mahogany, the bullet tree, and iron-wood, the red wood and sapodilla, are the favourite resorts of the heron, that majestic bird which seems in unison with the wildest solitudes of nature.

Far up some brook's still course, whose current mines
The forest's blackened roots, and whose green marge
Is seldom visited by human foot
The lonely heron sits, and harshly breaks
The sabbath-silence of the wilderness :
And you may find her by some reedy pool,
Or brooding gloomily on the time-stained rock,
Beside some misty and far-reaching lake.
Most awful is thy deep and heavy boom,
Gray watcher of the waters ! Thou art king
Of the blue lake : and all the winged kind
Do fear the echo of thy angry cry.
How bright thy savage eye ! Thou lookest down
And see'st the shining fishes as they glide :
And poising thy gray wing, thy glossy beak
Swift as an arrow strikes its roving prey.
Ofttimes I see thee through the curling mist,
Dart like a spectre of the night, and hear
Thy strange bewildering call, like the wild scream
Of one whose life is perishing in the sea.

M'LELLAN.

Passing over a variety of groups and genera, which belong to the ancient continents, we notice in the Apolocerine Tribe, the wool-bearing Antelope (*A. lanigera*), the Ovine, and the Chichiltic. The first of these interesting animals was observed by Lewis and Clark as low down as the forty-fifth degree of north latitude, though it chiefly affects the elevated regions of the Rocky Mountains, and those near the head waters of the Columbia. The sources of muddy rivers, such as the Saskachiwin, and Athabasca, are some of their favourite resorts, but they are said to be less numerous on the eastern than the western slope of the Rocky Mountains. Genuine mountaineers, they are, rarely, if ever, seen at a distance from their own upland haunts, of which the climate and productions seem best adapted to their nature and mode of life. At the beginning of summer they hasten to the peaks and ridges in quest of pasture, but they retire to more sheltered places during winter.

He who visits those stern regions when autumn is receding from the glens and valleys, may see troops of these wild creatures coming down the mountains. None of the animal creation are more in harmony with the solitudes of nature; their long hair stands erect, and gives them a most shaggy appearance; their ears are rather long and pointed, and a profusion of hair, depending from either side of the face, and beneath the throat, streams like a beard upon the wind in their rapid and perilous descent. Their flesh has a musky flavour, and is, at best, unsavoury; and hence, though they are easily approached, the hunter rarely pursues them unless

impelled by hunger. Their fleece, too, is esteemed of little value by the traders, and is used only as a covering from the cold; yet good judges have asserted that the silky fineness of the wool is not surpassed, even by that of the Cashmere Goat. It is, therefore, to be regretted that the patriotic intentions of naturalizing this animal, as expressed by the late Lord Selkirk, were not carried into execution.



THE WOOL-BEARING ANTELOPE.

The Ovine Antelope (*A. mazama*), bears a great affinity to the preceding species in every essential character. Some naturalists conjecture that he is merely a variety, and that the colour and the quality of his fleece may be ascribed to a residence within

the tropics. Nor is it unworthy of remark, as a curious fact connected with the geographical distribution of animals, that the ruminating species do not willingly extend over latitudes of different temperature; and that whenever this occurs, we may generally find that they have journeyed across high mountain ridges, where the difference of climate was not considerable.

The specimen brought to Europe, and noticed by the Editors of Cuvier's *Animal Kingdom*, was killed by the Musquito Indians in a rocky forest, not far from the river St. Juan, and the lake of Maracaibo. Those which inhabit the vast plains that extend on the shores of the upper Missouri, find means to render the prickly pear subservient to their necessities, notwithstanding its terrific thorns, by cutting it up with their hoofs. But, in general, they feed on the cones of different species of wild pine, on aromatic shrubs, and on those rich grasses which grow luxuriantly beside the forests, or

Where in the sunny valleys you may see
 The wild deer sporting on the meadow ground,
 And, here and there, a solitary tree,
 Or mossy stone, or rock with woodbine crown'd.
 Where oft the cliffs reverberate the sound
 Of parted fragments tumbling from on high;
 And from the summit of that craggy mound
 The perching eagle oft is heard to cry,
 Or on resounding wings to shoot athwart the sky.
BEATTIE'S *Minstrel*.

Wool-bearing animals are uniformly meek and inoffensive creatures, and capable of domestication, because essential to the comforts of civilized life.

The fleeces in which they are wrapped resemble hair in some respects, though differing materially in others. Like the hair of quadrupeds, they attain perfection in one year, and then fall off to be succeeded by another fleece ; but still an obvious difference subsists between them. Wool grows uniformly on every part, and is regularly shed ; each filament springs simultaneously, the fleece grows together and loosens from the skin at the same time, and then falls off, if not previously shorn, leaving the animal covered with a short coat of young wool, which, in its turn, undergoes the same regular mutations. Hairs, which are no other than fine tubes rising from the pores of the skin, and serving either for ornament or covering, are uniformly of the same thickness, but the fibres which constitute wool are generally finer at the base than at the point.

These fleecy coverings are not only given for the benefit of the creatures to whom they are assigned, but serve also for the use of man. Who does not know that one of England's most valuable manufactures is based on the fleece ? and no doubt the period will arrive when the wool-bearing animals of America will be rendered equally available. This fleece, when removed by shearing from the back and shoulders of the wearer, affords abundant occupation for the poor at all times and seasons of the year, and has founded many ample fortunes.

It is not to man only that the innocent sheep gives a portion of her covering. It is often stolen by the furze bushes amongst which she feeds, and whose bright yellow blossoms form such conspicuous ornaments on the village common. Troops of little

birds resort thither, and carry off from them, as from a storehouse, materials with which to make their nests, and to form a bed for their callow young. Thorns are generally disliked. The school-boy, who climbs into a hedge to gather blackberries,—

When duly eager of the tempting store,
Adventurous hands the thorny maze explore,—

is often deterred from seizing the finest clusters by the strong prickles which surround them. Village maidens, too, whose hands are scratched, and their frocks torn, when gathering violets among the bushes, have little reason to speak well of them. Yet both thorns and prickles are posted as guardians in the places where they grow. They abound on the stems and branches of some of our sweetest flowering and berry-bearing shrubs. Poets and moralists will tell you that they convey many lessons to the passer-by; naturalists also speak of them as answering important purposes in the vegetable world.

Returning to the productions of America, let us take, for example, those which grow on the leaves of the *Sagus genuina*, or sago plant. While the tree is young and tender, the leaf stalks are furnished with thorns which resemble sewing needles. These thorns are essential to the preservation of the plant, and without them the sago would be lost to mankind. Wild hogs abound in the country of the sagus, and are observed to be very fond of the young plants; but they are deterred from uprooting them by the sharp points which defend the leaf-stalks, and which often inflict great pain

upon the unheeding passenger. A palm has also been observed in the woods of Mexico which is equally guarded by fierce thorns, doubtless because the plant does not grow high, and consequently the fruit and flowers would fall a prey to every invader. Our native woods afford abundant instances of similar guardianship. The leaves on the lower branches of the holly are covered with thorns, while those which grow towards the summit are without any. Thus is a citadel provided for small birds, which defends them from the wild cat and weasel. Other plants are equally protected; the hawthorn and the gooseberry, the bramble, raspberry, and wild rose, with all the numerous tribe which

Fringe the forest's devious edge, or,
Drooping, bend above the rock,
And through the foliage show their head,
With narrow leaves and berries red;

while others are stationed on commons and in hedge-rows, and along the borders of the road, and preserve abundance of winter food for the songsters of the grove. You may see them flying in and out among the branches, and uttering their cheerful notes, as if in thankfulness for the bounteous store-houses which are open to them when the corn is gathered in, and the seeds are scattered from their capsules by the autumn wind.

The woods are stripped by the wintry winds,
And faded the flowers that bloomed on the lea,
But many a gem the wanderer finds,
The ruby fruits of the wild briar tree.
The strong are bowed down, the beauteous are dead,
The blasts through the forest sigh mournfully;

And bared is full many a lofty head,
But there's fruit on the lowly wild briar tree.
It has cheered yon bird, that, with gentle swell,
Sings, "What are the gaudy flowers to me?
For here will I build my nest, and dwell
By the simple, faithful, wild briar tree."

The American Argali (*Ovis pygargus*) was known in the time of Hernández by the name of the Californian sheep: Venegas and Clavigero afterwards noticed it, and the Canadian fur traders called it Calblane. But we owe a more perfect knowledge



THE AMERICAN ARGALI (*Ovis pygargus*).

of this animal to M'Gillivray, who, after his travels in the Rocky Mountains, first drew the attention of

zoologists more particularly to the subject, and its spoils have since been transmitted to Philadelphia and London.

The species live in flocks, consisting of thirty or forty, and are headed by an experienced leader. They bound swiftly along the ridges of high mountains, and, during summer, prefer the highest peaks, but descend into the plains when their usual haunts are wrapt in snow and visited by hurricanes. If the American species be the same as the Asiatic, their ancestors must have passed over the ice at Behring's Straits. This passage may be conjectured as comparatively of recent date, since the argali have not spread eastward beyond the Rocky Mountains, nor northward further than California.

Little is known with certainty respecting the general characteristics, the habits or mode of life, among the American argali. We shall therefore briefly add to this short notice by observing that along the neck of the argali runs a stiff and robust cartilage, braced from the head to the middle of the back, and designed to assist in supporting the weight of the head. Armed with strong horns, the head of the argali is a heavy weight, acting at the end of a long lever, and in a direction nearly perpendicular to the joints of the supporting neck. The bones of the neck would consequently be in danger of dislocation, were it not for this admirable provision, which is also found in the necks of all large quadrupeds, but never in the human subject; evidently because man, who carries his head erect, does not require any assistance of the kind. We may also conclude that the eyes of the argali are pro-

vided with that useful membrane which is generally assigned to ruminating animals—to such as seek their food, not only on commons and in meadows, but among brushwood, and are consequently liable, without some protection, to have their sight injured by coming in contact with sharp twigs or prickly shrubs.

One truth is indelibly inscribed on all the wonders of creation—that as a father careth for his children, so the Most High sustains and cherishes all which He has made. This truth is marked on every leaf; it is written on every flower; it is made known by every insect that flies from one blossom to another. It is proclaimed in the song of birds, in the whisper of the wind, in the murmur of waters running swiftly. It resounds from one end of the universe to another, and lest men should doubt it amid the sin and misery of their fallen state, it is recalled to their remembrance by every living creature that wings the air, or crosses their daily walk. The world is filled with mementos of the love of God, but we too frequently neglect them. Naturalists, or rather I should say, the admirers of things created, for the sake of Him who created and sustains them, have kept alive this blessed truth, amid the clash of contending systems and the forgetfulness of that sacred book which brought the knowledge of “life and immortality to light.” We owe much to them; and though it be true of naturalists that their lamps glimmered faintly amid the darkness of paganism, and that they threw their faint and tremulous light but a little way into the obscurity of the middle ages, the light was still pre-

served, and some were gladdened by it when all around was uncertainty and gloom.

We have spoken elsewhere of the genus *Catoblepas*, a race confined to Central and Southern Africa, living in herds upon the desert, and seeming as regardless of shade and water as the ostrich and wild guacha. North America produces animals that resemble them in many particulars, wanting, indeed, the mane and beard, but equally slender in the limbs, and exhibiting some characteristics which Pliny notices as peculiar to the gnou. A stuffed specimen of Musk ox, when the woolly hair is destroyed, might be mistaken for a large gnou in a similar condition, but an immense distance intervenes between them. High latitudes bestow their usual woolly covering on the former: an unknown local cause which deprives several northern animals, especially the ruminating kinds, of the usual length of tail, also acts upon the musk ox, and its body is much heavier and somewhat lower on the limbs than that of the *catoblepas*.

We have reason to conclude that this species once inhabited the north-eastern portion of Asia; perhaps they even now exist in the unvisited parts of that extensive region; but their favourite resort is to the north-west of Churchill river, in the Hudson Bay country, though occasionally descending as far southward as the province of Guaiavira. They prefer mountainous and unwooded places to the forest, and climb with ease the most precipitous rocks. One might almost fancy that they scorned

the snares of the hunter, for few animals are more fearless, or less easily entrapped. Bounding from rock to rock, descending and ascending with incredible facility those high mural barriers which rise like walls before the hunter, they stand and gaze upon him till nearly within reach, and then in a moment they are gone; the next they appear upon some high ledge, looking calmly down, as if in derision of his attempts to seize them. Captain Parry met this species as far north as Melville's Fort, early in the spring. Most probably, the herd was then migrating in quest of pasturage, for during winter they are obliged to subsist on moss, the tops of pine-shoots, and such willows as grow in sheltered places, from which they can shake off the snow.

We cannot dismiss this portion of our subject without briefly noticing the heads of the fossil ox (*O. pallantis*), noticed by Pallas as being found on the banks of the Obi, and near Tundra, north of the Arctic circle. Though fossil, they are apparently very recent; and Baron Cuvier admits with Pallas the possibility of their having reached Asia from America on the field-ice. Bears and seals are conveyed in this manner from one continent to another; they fall asleep on masses of ice, which often begin to move almost instantaneously, impelled either by the wind or currents, and on awaking find themselves in far distant regions. Nor do they always voyage without provisions; it sometimes happens, during summer, that bears, when wearied with hard fighting, will drag their prey beneath some sheltering iceberg, and fall asleep, till the heat of the sun

causes the separation of the mass, and sends them adrift upon the waves. This will also account for the discovery of many fossil remains in places where the animals to which they belonged could not possibly arrive by any other means.

The musk ox was long mistaken for the European Bison, though materially differing in his anatomy. During winter he resides with his companions on the mountains, or in the deep woods of temperate North America; in those especially where the Great White, or Weymouth Pine, the most beautiful of the transatlantic species, forms a striking feature in the forest scenery of Vermont, New Hampshire, and some parts of Canada. This noble tree rises at nearly half its elevation above the summits of the other trees, and like the tropical palms, so beautifully described by St. Pierre and Humboldt, resembles a forest planted upon another forest, where the sighing of the wind in the topmost boughs sounds like the murmur of a distant waterfall, and adds to the solemnity produced by the gloom and silence of those interminable shades.

Bisons formerly ranged over the vast extent of the North American states. Lawson informs us that, even in his time, some were killed in Virginia; and Cumming relates in his sketches of a tour to the Western country, that long after Kentucky began to be generally settled, and ceased to be an Indian hunting-ground, buffaloes, bears, and deer were so plentiful, that little or no bread was used, and the facility of gaining them prevented the progress of agriculture, until the poor innocent buffaloes were extirpated, and other wild animals much thinned.

But the process of extirpation has not been relaxed, and the bison is now driven beyond the lakes, the Illinois, and southern portion of the Mississippi rivers, their range extending from the country west of Hudson's Bay to the northern provinces of Mexico. They have not yet crossed the entire breadth of the mountains at the head of the Missouri, though in some parts they penetrate the most accessible vallies, particularly that of Lewis river. Mr. Henry and his party of hunters wintered there, and subsisted chiefly upon the flesh of these animals, which they saw in considerable numbers; yet the Indians affirmed that it was unusual for the bisons to visit that neighbourhood.

But who may reckon the vast herds that crowd the boundless prairies of the river Platte? Dr. James and his companions spoke of them with admiration, in their interesting *Narrative of an Expedition to the Rocky Mountains*. Their view on the opposite margin of the tranquil river, had been interrupted for some time by a swell of the surface, which extended along its shores. On surmounting this undulation, they saw before them, upon the broad expanse of the wide prairie, an innumerable multitude of bisons, grazing in undisturbed possession, and obscuring the verdant plain with the density of their numbers; right and left, far as the eye could reach, the crowd seemed hardly to diminish: at least ten thousand must have burst upon the sight at the same instant. Small columns of dust were occasionally raised by such as were pawing the earth and rolling, and much amusement was afforded by the unwieldy playfulness of

some of these huge creatures, their real or affected combats, and the slow or rapid progress of others to and from their watering-places. On the distant bluffs, individuals were constantly disappearing, whilst others were presenting themselves to the view, until, as the dusk of evening increased, their massive forms, thus elevated above the line of other objects, were but dimly defined on the skies.



THE BISON (*Bos bubalus*).

In the morning, our travellers again sought the living picture, but upon all the plain which last evening so teemed with noble animals not one remained; the prairie's wide unbroken surface of waving verdure was unenlivened by any moving object, and bounded only by the vast horizon. But this uniformity was of short duration; for, in addition to the vast herds of bisons that were con-

tinually coming into view, the country along the Platte was animated by herds of deer and badgers, hares and wolves, eagles, buzzards, owls, and ravens; and these, with an endless variety of rare and interesting plants, relieved, in a great degree, the uniformity of its cheerless scenery.

The country seemed, indeed, to be filled with a greater number of animals than its productions were able to support. It was manifest that the bisons, then daily thronging in such numbers, were moving towards the south. Experience may have taught them to repair at certain seasons to the luxuriant plains of Arkansa and Red River, but strange it seems that they should return to the regions of the Platte. Wherever the troops moved, their attendants failed not to follow,—gangs of meagre famine-pinched wolves and flights of ravenous birds.

In riding through the same dreary and yet interesting land, it was amusing to observe the movements of the various animals by which the narrators were surrounded. As the wind blew fresh from the south, and their scent was borne directly across the Platte, they could distinctly note its progress over a distance of eight or ten miles, by the consternation and terror which it excited among the buffaloes. The moment the gale reached them, away they ran with as much violence as if pursued by a party of mounted hunters, and instead of hastening from the danger, they turned their heads towards the wind; eager to escape from the terrifying scent, they pushed forward in an oblique direction towards the party, and, plunging into the

river, they swam and waded and ran with the utmost violence, breaking, in several places, through the line of march, which lay along the left bank of the Platte.

It has been remarked by hunters, and the fact is curious, that a white man is far more terrifying to wild animals, the bison especially, than an Indian. This creature comes in the course of his migrations into the neighbourhood of the permanent Indian villages on the Missouri and the Platte, about the time when the inhabitants are absent on their winter's hunt; and at the period of their return large groups are found peacefully occupying the surrounding pasture-grounds. But such is not the case wherever the white man has fixed his abode; from about his neighbourhood the bison uniformly disappears in the course of a short time, and never returns again. Truly the unoffending bison has good reason for his dislike. White hunters frequently attack large herds of these fine creatures, and, having slaughtered as many as they are able, leave the carcasses to be devoured by wolves and birds of prey. This inconsiderate and cruel practice causes them to fly both far and soon from the neighbourhood of our frontier settlements.

Bisons are very numerous on the banks of the Red River, on those open and undulating plains, and in half-wooded valleys, where small elms are seen bending beneath the weight of innumerable grape-vines, of which the purple clusters crowd in such profusion as to give a colouring to the landscape. There Dr. James and his companions often heard, with dismay, the continual roar of the immense herds

which surrounded them,—a harsh and guttural noise, intermediate between the bellowing of the domestic bull, and the grunting of the hog. This appalling roar was varied at intervals by the desolate cries of jackalls and screech-owls, by the howling of white-wolves, and the solemn notes of the hooting-owl,—wild and discordant sounds, and yet in unison with the inhospitable wastes, in the midst of which the strangers were then reposing, and which vividly reminded them of their remoteness from the comforts of civilized society. Affecting, too, was the strange tameness of all and each of these wild creatures. When the morning dawned, both wolves and bisons on the windward side, were seen to be so totally unaccustomed to the sight of men, that they moved slowly to the right and left, leaving a lane for the travellers to pass; they would even linger for a considerable time, and almost within reach of the rifles, which they regarded with little appearance of alarm. The immense tracts of denuded land which are thus tenanted by innumerable living creatures, were most probably laid waste by the ravages of fire. Since the occupation of the deep alluvial lands of the Mississippi and Missouri by permanent inhabitants, the custom of setting fire to the dry grass has been prevented, and a dense growth of oaks and elms has sprung up. But in those vast districts which are solely occupied by wandering tribes, a heavy annual growth of herbaceous plants is produced, which, after the autumnal frosts, become dry, and easily take fire. In a country occupied by hunters, who kindle their camp-fire under every shady covert, and who often, like the Mongols on

the grassy deserts of Asia, set fire to the plains in order to attract herbivorous animals, by the growth of tender and nutritious herbage which springs up after the burning these annual conflagrations frequently occur; trees are consequently destroyed, and the forests being thus broken, the growth of grasses and annual plants is greatly facilitated by the richness of the soil, and the free admission of the sun's rays.

In these extensive and fertile meadows, bison-paths are as frequent and almost as conspicuous as the roads in the most populous parts of the United States. They converge in all directions to the places where water is to be found, and by following their guidance travellers are led to the spot, where a small spring often drips from the side of a sandstone cliff. It was sunny weather while Dr. James and his party pursued their way to the Rocky Mountains, and the bisons were in their summer coats. At this period they are less terrific than when clothed in long shaggy winter vestments, but still their physiognomy is menacing and ferocious, and their whole appearance formidable; he who first sees them in their native wilds, must be endowed with no ordinary courage if he does not shrink at their approach. Their eyes are small and piercing, and the head and front is so thickly guarded with a dense mass of hair, as to deaden the force of a rifle-ball, which often rebounds from the forehead, or lodges in the long shaggy curls, and causes the bison to shake his head as he bounds heavily forward.

The animals common to the prairies were once

equally numerous in the neighbourhood of St. Louis, between the Mississippi and the Missouri, below their junction in those extensive and fertile meadows which stretch far away to the horizon, and are either bounded by its mighty concave or by some deep forest; but now the elk, and deer, and bison, the native inhabitants of these delightful scenes, are chased away by the incursions of the white settlers, whose dwellings extend over the vast plain at wide intervals. Hence in many parts the dense and uniform growth of grass has risen untrodden and uncropped, and is seen to wave in ceaseless undulations as the wind sweeps lightly across it, while the slender and graceful *Heuchera Americana* rises above the grass, and resembles a grove of spears bristling over an embattled host.

The strength of the bison is proverbial, and his heavy tread is often apparent in those broad shallow excavations of four or five feet broad, and from six to eighteen inches deep, which abound in countries frequented by these animals. They are of rare occurrence near the Missouri, as far as Engineer Cantonment, and in districts where the bison is now seldom seen, yet the traces remain, though overgrown with grass. But as you approach such countries as are still the residence of these magnificent creatures, the hollows become more numerous; beside the Platte especially, they present considerable impediments to the traveller, and are without herbage, being covered with dust. They are made by the bisons in scraping up the earth with their forefeet while dusting themselves; they serve also as places for rolling and wallowing, a gratification

which the animal indulges in as frequently and in the same manner as the horse.

Indians hunt these creatures for their flesh and skin, and when the business of planting maize and beans, pumpkins and corn, is over, the chiefs assemble in council; a feast is then proposed, and one of the most distinguished chiefs is requested to prepare it in his hut. The individual thus honoured, immediately returns home and requests his wives to "have pity on him, to clear and adjust the apartment, to spread abroad the mats, to collect wood, and bring water for cooking. He further asks them to provide three or four large kettles, to prepare the maize, and to kill their fattest dog for a feast." The squaws generally murmur at this last proposal, being reluctant to sacrifice one of their favourites, which are serviceable in carrying burdens, like the dogs of the wandering Tartars, but when informed of the honour that awaits them, they undertake the preparations with equal pride and pleasure. All being at length ready, the cheerful squaws give notice to their husband, who summons two or three public criers from the village, seats them by his side, and after the ceremony of smoking, sends them forth to summon the bidden to the feast. "Speak in a loud voice," says he, "and tell them to bring their bowls and spoons."

When the guests are all assembled, the chief rises, and, extending his hand towards each in succession, thanks them for the favour of their company, and opens the council by inquiring whether the quantity of provisions will justify them in continuing longer to weed their maize; or if it be decided to depart,

what must be the direction, the extent and object of their route; whether it would be proper to ascend Running Water Creek, or Spreading Water, or Flat Water, or to hunt the bison between the sources of those streams; or whether they should proceed further towards the Black Hills of the south-west, in pursuit of wild horses? Having thus disclosed the business of the council, some aged chief calls the attention of the assembly to the subject for which they are convened, advises them to pay attention to the questions thus wisely put, and admonishes them that they have ample cause to return thanks to the Great Wahconda, or Master of Life, for having sent such a man among them. When a proper route is decided on, the criers remove the kettles from the fire, and the food is served round. Each guest returns his acknowledgments to the host with such respectful expressions as become his relative position, and Thank you, father, uncle, or younger brother, resounds on all sides. The criers then help themselves out of the kettles, but are careful to leave a portion for those from whom they were borrowed. Lastly, when the feast is over, the company quietly withdraw, first the warriors, afterwards the chiefs. The criers next proclaim throughout the village the praises of the host, and communicate to the expecting people the resolution of the council. Great preparations are now made, the women are all life and animation; mockasins and garments are seen being mended, household goods packing up, and saddles and dog-sledges getting ready. When the happy day arrives, the horses and dogs are loaded, and after having closed the doors of their several habita-

tiens by placing brushwood before them, forth they set, burdened with as much as they can conveniently carry. Those affluent chiefs and warriors who have horses mount their families, but the greater number of young men necessarily go on foot.

When arrived within sight of the wild bisons, the tribe proceeds to encamp at the nearest water-course, where they set up their tents and kindle fires, while the hunters who are in advance of the main body make signals in order to give notice to the people. If they see a troop of bisons, they throw up their robes in a peculiar manner, as a sign to halt; another disposition of the robe intimates the proximity of an enemy; and if one of their party has been killed, two of the survivors communicate the intelligence by running towards each other, and, on passing, one of them casts himself upon the earth. The hunters after making the first signal return as expeditiously as possible, and thanks are offered by each to the Master of Life. "Thank you, Great Spirit, I am poor and hungry, and I want to eat." Criers are then sent out to communicate the joyful news, to tell the people that they must keep their squaws in good heart, that their trials are all over, and that to-morrow they shall have plenty of meat. On the following morning all the men depart early in pursuit of their favourite game. They are generally mounted, and armed with bows and arrows. The soldiers of the day accompany the rapidly moving cavalcade on foot, armed with war-clubs, and the whole are preceded by an Indian bearing a pipe. Having approached as near the herd as possible, they separate into two bands, who pass at full

gallop to the right and left, and perform a considerable circuit, with a view to surround them. They then close in upon the animals, and each man endeavours to kill as many as possible.

On such occasions the Indians display their skill in horsemanship, and dexterity as archers; and, notwithstanding that the same animal is sometimes feathered by arrows from different archers, each man knows his own weapon, and can also ascertain from the nature of the wound whether it will produce or has occasioned death. Hence it happens that quarrels respecting the prey rarely occur, and that it is consigned to the fortunate individual whose weapon penetrated the vital part.

About the month of August, the Indians return towards the deserted village, visiting in their journey the Pawnee villages, for the purpose of trading in guns and horses; and when returned, they continue sedulously employed in their usual avocations till the latter end of October, at which time they again depart, and move in small detachments on both sides of the Missouri and its tributaries, as far down as the Platte, trading as they go for various articles which they require during their autumnal, their winter, and their spring hunts. Having obtained these, they set forth in pursuit of deer, or occupy themselves in trapping the beaver and otter.

Yet the assiduous hunter often returns to his temporary residence in the evening, after having unsuccessfully exerted himself through the day, hungry, fatigued, and cold, with his mockasins frozen to his feet. His faithful squaw may be unable to supply his wants, but she seats herself beside

him near the little fire, and after having put aside his hunting implements, she rubs his mockasins and leggins, and pulls them off; she then gives him water to drink and his pipe to smoke. His children assemble round him, and taking one upon his knee, he proceeds to amuse it with the adventures of the day, that his squaw may be informed of them. "I have been active all the day, but the Master of Life has prevented me from killing any game; but never despond, my children, and your mother; I may be fortunate to-morrow." He often sings till midnight, even when retired to his couch, while his careful wife remains awake to dry his clothing. On the morrow he again sallies forth before the dawn, and may soon return loaded with provisions. Such is the life of a native hunter, and such the privations and the pleasures to which he is exposed*.

Indian hunters often pursue their prey amid the rudest and most colossal scenes. Dr. James, to whom I have frequently referred, observed the tract of bisons through an hideous pathway so hemmed in with impending rocks, that the view was nearly as confined as in a subterraneous passage. So dismal was the place that few adventure to go through it, except, indeed, those bold and enterprising men who delight to chase the bison in his wildest recesses. But bright and cheering was the scene that burst on the astonished travellers, when, after ascending a steep acclivity, guarded on either side with a wall of rocks which

* From *Memorandums of an American Naturalist*.

nearly obscured the light of day, they came through a grove of juniper to the border of an open plain, where the expanse of the grassy desert opened suddenly upon their view. The change was grateful, for instead of a bison path, leading amid gloom and danger, appeared a boundless and varied landscape,—the broad valley of the Arkansa, studded with little groves of timber, and terminated in the back-ground by the shining summits of James's Peak and the Rocky Mountains, while the snowy pinnacles of more distant ranges limited their view on the right. To the left, and before them, lay an extended plain, diversified with vast conic mounds and insulated table-like hills, while herds of bisons, antelopes, and wild horses, gave life and cheerfulness to the scene.

As the day advanced, and the heat of the sun began to be sensibly felt, vapours arose from off the plain, and magnified every object. Thus they continued, and often presented the appearance of a wide expanse of water in every valley upon which the traveller could look down at an angle of about ten degrees. The effect was so beautiful and perfect as to deceive the most experienced, even those who had witnessed a similar illusion on the sandy deserts of the East. A herd of bisons, at the distance of a mile, seemed standing in a clear transparent lake, and what appeared the reflected image, was as clearly seen as the animal itself. This singular appearance is common in Arabia, but was hitherto unnoticed on the prairies of America. The Persians call it "the water of the desert;" and in the Sanscrit language it is termed "the desire of the antelope."

Yet the mirage has been frequently observed on the Llanos and the Pampas, those immense plains which stretch far beyond the limits of the visible horizon, and concerning which, as affording peculiar features in transatlantic scenery, we shall proceed to offer some closing observations. The Pampas are by far the most extensive; lying on the eastern side of the Andes, and extending from their foot to the shores of the vast Atlantic; and as the sides of lofty mountains present different zones of plants, so remarkable differences of vegetation are apparent throughout these plains. The ground, on leaving Buenos Ayres, is covered for nearly one hundred and eighty miles with clover and thistles; this is the first division, beyond which an immense prairie of long grass extends to, at least, four times the distance, and is terminated by a beautiful region of evergreen trees and shrubs, reaching to the foot of the Cordilleras. These three divisions are entirely distinct; the trees and shrubs which diversify the last, never encroach upon the prairie: their seeds, or cones, scattered by the wind, effect no lodgment amid the waving grass, which seems to be without a weed; while in the woody region such beautiful order prevails in the growth of the trees, that a horseman may gallop between them in every direction. The district of clover and large thistles varies, on the contrary, at different seasons of the year. During winter it presents the appearance of an immense clover field, over which herds of wild cattle graze in unrestrained liberty. As spring advances the clover disappears, and the thistles, which began to lift their heads above the herbage,

rapidly gain an ascendancy, and rise to the height of ten or eleven feet. At this time they form an impenetrable barrier: even the puma and the jaguar cannot push their way amid the strong and prickly stems and leaves, and he who endeavours to pursue his accustomed journey finds himself impeded on every side. Captain Head relates that so speedy is their growth, and so effectual the barrier they present, that an army might be surrounded and imprisoned before it could escape. But as the sun advances in the heavens the tall thistles yield to the increasing heat; the stems become dry and withered, and are broken down by the hurricanes that sweep over the plains. The nightly dews, also, fall heavy upon them, and occasion a decay as rapid as their first production; thus decomposed, they fertilize the soil, which is again speedily covered with a luxuriant growth of clover: this, in its turn, affords a shelter to the seeds of innumerable thistles, that soon spring up, and cause the prairie's wide extent to appear in the distance like a vast turnip field.

In these regions wild and wandering tribes occasionally pitch their tents at intervals. These are the native Indians, some of whom journey from place to place; while a few straggling towns and villages, with here and there a solitary hut, betoken the abode of others, who are employed in keeping cattle. They are called Gauchos, and are descended from the Spanish settlers—a strong and active race, celebrated for the strength and swiftness of their horses, and their dexterity in noosing wild cattle. Captain Head journeyed with a party of them, during

one period of his expedition over the Pampas, at the rate of more than a hundred and forty miles daily, and that for weeks together, and he pronounced this mode of life to be pleasant and exhilarating.

The temperature of the Pampas, like that of every other portion of the globe lying under the same parallel of latitude, is extremely hot during the summer months, but in winter the degree of cold is not much less than that which prevails with us. Those who traverse the woody region, or the vast unvaried surface of the prairie, frequently observe the remains of animals which have perished from fatigue or sickness, and which have dried up without undergoing the process of decomposition, in a manner like that which occurs in the deserts of Africa. This curious fact is owing to the level nature of the country, to its distance from the sea, and the dryness of the atmosphere; and hence we have reason to believe that if the Pampas had consisted of rock and sand, the difficulty of crossing it, from extreme heat, would have been nearly equal to that of the African desert of Sahara. For the sun-beams, acting both on air and land, communicate to the latter a more rapid and permanent degree of heat; consequently, the lower portion of air derives from the earth, if unclothed with verdure, a higher temperature than belongs to it, and when it rises into the upper region of the atmosphere, its place is immediately supplied by another stream of air. This stream is heated in its turn, and then rapidly ascends; and thus a constant current of hot air arises from off the surface, and necessarily prevents those water-urns of the

firmament, as rain-clouds are called by the Arabs, from passing over the desert, and fertilizing it as they pass: hence no showers descend on the parched soil, which remains destitute of vegetation, excepting in those favoured spots, the Oases, which rise like islands of verdure, surrounded by a waste of sand. Beautiful they are: extensive too, and sufficiently shady to screen large caravans from the burning heat of the sun. They afford a resting place, where weary men and camels may renew their strength, and drink of the cool streams that flow among them: where the date-palms also grow, those life-sufficing trees, which yield both food and shade. Without these fertile spots, no travellers, however enterprising, might hope to cross the burning desert of Sahara, which equals one half of Europe in extent: an ocean of sand, with bays or gulfs of lesser deserts branching off; yet, by means of the refreshment which the Oases afford, the Sahara is often passed in safety. Travellers assign to natural causes the existence of these wonderful spots amid wastes of burning sand. They tell us that the irregular ridges of high rocks, which rise in their vicinity, attract the floating clouds, and cause them to distil in rain, and hence the fountains of clear water that nourish and flow beneath the palm trees. There is not, throughout the whole extent of the habitable globe, a more extraordinary spectacle than the oases of which we speak. Travellers pass, by an almost immediate transition, from the surface of a burning desert to tread on soft and luxuriant herbage, to rest beneath the shade of noble palm trees, and to quench their thirst at ample streams. So at

Elim, three score and ten of these beacon trees, seen from a distance, invited the Israelites to refresh themselves beside twelve wells of water.

But oases are unnecessary in the Pampas, for there, far as the eye can reach, the earth is screened from the effect of heat by a rich growth of grass and clover. Little or no upward current consequently arises to prevent the clouds from pouring forth their rain, and hence those plains are crossed without difficulty, while towards the vast Cordilleras, noble trees and shrubs, refreshed by frequent showers, present a striking contrast to the unvaried surface of the prairie.

Widely different from the Pampas, with its luxuriant herbage and wooded region, is that mighty plain which stretches beyond the fertile and undulating valleys of the Caraccas, and the shores of the lake of Jacaraqua, dotted over with islands. The traveller who passes from those fertile and peopled regions, covered with beautiful trees, and producing fruits and flowers in abundance, seems to have crossed the very boundary of civilized life. Behind him are thriving towns and pleasant villages, arts, and intellectual improvements; before him a gloomy wilderness, where, for a long distance, no hill, nor even undulation, varies the surface of the desert, excepting here and there a few isolated banks, which, though apparently of small extent when compared with the measureless sweep of the barren plain on which they rest, often comprise a space of more than one hundred miles, and appear like sand-banks in the midst of a waveless sea. Further on, in the lone wilderness, rise impenetrable thickets, or vast

forests ; and further still, between the Orinoco and the Amazon, extend those gloomy woods filled with aged trees, which seem coeval with the era of the deluge. There huge masses of primeval granite rise on either side of majestic rivers, and narrow their foaming waters, which rush beneath them with terrible impetuosity, now dark with shadow, and now raging and sparkling, as if indignant at restraint, and impatient to flow on in a wider channel. He who remains during the night in their vicinity, when every sound is heightened, and even the rustling of the wind among the trees resembles the deep dull roar of a distant torrent, listens with dread to the growl of the tiger as he springs upon his prey, and the answering howl of innumerable monkeys. Goat-suckers, too, utter their mournful voices, and the plaintive cries of such birds as love the night seem like the unquiet wailings of restless and discontented spirits. Alligators are then in motion, and at intervals their noise can be readily distinguished amid those of the jaguar and the owls, the goat-sucker and the frogs. It is a singular and awful sound, so loud as to be heard at the distance of a mile. It is described as resembling a suppressed sigh, bursting forth on a sudden, as if no longer capable of being withheld ; as if it told forth the long concealed misery of some giant breast ; and when one thus utters the startling sound, another immediately rejoins. Then all is still again, and silent as midnight. Strange contrast to the clear calm heavens, sparkling with glorious constellations, and the beautiful moon travelling in her brightness through the immensity of space.



THE BAMBOO.

Cane-brakes abound in this wild and lonely portion of the globe. They extend for many miles, and are often rendered nearly inaccessible by the density of their growth. Mention has been made concerning the Bamboo, of which they principally consist: in one place, as yielding silex; in another, as affording an excellent pasturage for cattle*; to which it may be added, that bamboos grow spontaneously over the greater portion of the western districts of America, as well as in many others further

* See pages 28 and 73.

south. The height of each, when fully grown, is from twelve to thirty feet, and from one to two in diameter. Growing singly, they present the appearance of elegant arborescent canes, but more frequently the plants stand so close together, and become in the course of a few months so thickly tangled, as to present an almost impenetrable thicket, at which period the ground thus covered is called a cane-brake. These cane-brakes are seen frequently beneath the gigantic trees that form the western forests, interspersed with vines of different species, and plants of every description. It is extremely difficult for any one to make his way after a heavy shower of rain, or a fall of sleet, through the dripping branches, for the traveller shakes down such quantities of water, as soon reduce him to a state of the greatest discomfort. Hunters often cut a narrow path through the thickets, but more generally they push themselves backwards, and wedge a way between the stems.

Throughout the mighty range of the vast Llanos, which extend from the mountains on the coast of the Caraccas to the forests of Guayana, from the snow-clad mountains of Merida to the delta of the Orinoco, spreading south-westward like an arm of the sea, from the rivers Nichada and Meta to the unpeopled sources of the Guaviare, comprising a space of at least sixteen thousand square miles, one characteristic feature everywhere prevails. This feature is that of a marine bed left uncovered by the receding of the waters.

There are many appearances leading to the conjecture that the earth on which we tread is the basin

of the ancient sea*, and that the waters flowing at the era of the deluge into a still lower level, left their bed exposed and dry, and caused it to become a fit dwelling-place for men and animals. On no portion of the globe is this fact more strongly impressed than on the plains of the Llanos. He who journeys across them sees, for the most part, merely a wide expanse, at one time nearly level, at another with a gently swelling surface, which often in colour so exactly resembles the ocean, under a peculiar sky, that it is extremely difficult to dispossess the mind of a conviction that a rolling sea is actually in view. The effect is further heightened by the appearance of distant insulated trees, which rise above the horizon like strange sails heaving in sight. So exact is the resemblance in many parts that Captain Hall once observed, that if a sailor had been present he would immediately have conjectured what canvass these magical vessels were carrying. At even-tide the illusion is still more complete, and when the eye ranges over the magnificent expanse, the level line that forms the horizon appears exactly similar to the utmost verge of a tranquil sea. The stars also, as they rise and set, are clearly reflected in the stratum of air which rests immediately on the earth, and produce the same beautiful effect as when seen to sparkle on the bosom of the deep.

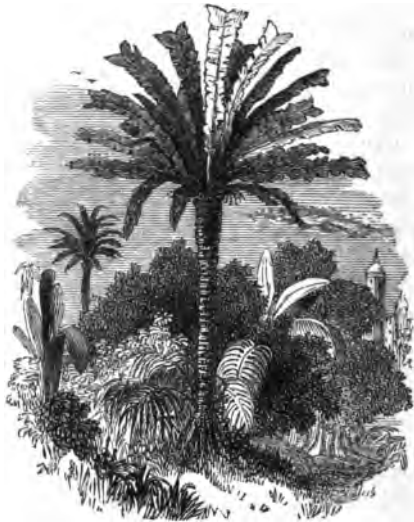
Humboldt also notices this remarkable illusion. When looking in the gray of the evening over those vast savannas that seem to meet the horizon, those plains covered with verdure and gently undulated, he thought that he beheld from afar the surface of

* Progress of Creation.

the ocean supporting the vault of heaven, while the tree under which he rested with his companions, the luminous insects that darted through the air, the constellations that shone towards the south, all vividly brought to their remembrance that they were far from their native land. Then it was that the power of association was most strongly felt. For if, at the same moment, the bellowing of a cow, or the roaring of wild cattle came remotely upon the ear, they were to them like distant voices resounding from beyond the ocean, annihilating both space and time, and bearing them from one hemisphere to another. The same traveller beautifully observes, that indescribable was the feeling of tranquillity which often seemed to pervade the mind when traversing those vast savannas, either by night or day, while contemplating the magnificent vault of heaven which appeared to encircle a mighty plain, where a few tufts of trees alone met the eye, and where no sound was heard excepting the monotonous cry of the solitary goat-sucker.

Those isolated trees which thus assume the aspect of strange sails when seen in the dim twilight, are generally Fan-palms, which grow profusely in different parts of these extensive plains. Rising to the height of twenty or thirty feet, they form noble groups of verdure, and whether standing singly or with others, they generally indicate the vicinity of fresh water. Hence the Indian maintains that Fan-palms mysteriously attract beneath them clear running streams, and that the Great Spirit planted them in arid deserts to make known the blessing, lest those who have to pass across the

otherwise uninhabitable plains should perish from thirst.



THE FAN-PALM.

The climate of the Llanos is far more temperate than that of any other country under the same latitude. Such, also, is generally the case throughout equinoctial America. Many causes unite in producing this effect. The continent of America becomes narrow towards the north; it is deeply indented with seas and bays, and presents, comparatively, a small surface of dry land to the action of the

sunbeams. Cold and frequent, too, are the winds that sweep over the Southern Polar ocean, and chill the current of sea water that flows from Terra del Fuego along the coast of Peru. The sea thus chilled, and the wind which aids in producing this effect, change the atmosphere of the adjacent countries; and the mitigation which is effected even in parts immediately beneath the Line, is further heightened by the number of mountain-chains, many of which are covered with perpetual snow, and lift their foreheads far above the clouds; by the majestic rivers, such as Europe has not to boast, and by the impenetrable forests that cover especially the equatorial regions, often to the extent of several thousand miles, and shade the earth, so as to preserve its moistened surface from evaporation.

The climate of the Llanos, when compared with that of the Sahara is, therefore, tempered, and allows an abundant growth of luxuriant herbage as well as of noble forest-trees. Yet, still, at certain seasons of the year the heat is strongly felt, and the cold also is severe. In England we observe with interest the arrival and departure of migratory birds, the successive opening of different flowers, and the unvaried rising of the stars. Those who dwell on the vast plains of which we speak might add to these, the regular and uniform succession of the several atmospheric phenomena which invariably occur. Two seasons, the dry and the rainy, divide the year, and are dependent upon the absence or the presence of the sun. Those countries which lie northward of the Line are visited with rain when the sun is in the northern half of the ecliptic, that is,

from April to October ; such, on the other hand, as are situated southward of the Line, have their rainy season also during the hottest period of the year. This merciful arrangement spreads on high a canopy of clouds, which screens both men and animals, and the vegetable world, from the otherwise insupportable heat of the sun's downward rays. Before the rainy season on the Llanos nothing can surpass the clearness of the atmosphere : the sky is constantly without clouds, and if one should appear, it would be considered by all who saw it as indicative of some alarming change. Meanwhile the breeze from the east and north-east blows frequently with violence, and this, added to the vertical rays of a cloudless sun, reduces the grass to powder, and causes the earth to crack in all directions. Funnel-shaped clouds of sand frequently arise from off the ground, analogous to water-spouts, so formidable to the mariner when at sea, and would be equally dangerous if not avoided when seen approaching. They are generally occasioned by the meeting of two winds at an angle, and by their turning upon a centre, at which time all light substances are carried up into the air by the whirling motion that ensues. These partial whirlwinds always arise during the prevalence of a dead calm : in this also the analogy between air and water is preserved, for on the latter the water is drawn up in a manner precisely similar to that of sand from off the desert. When one of these sandy whirlwinds arises it is fearful to be in the vicinity. A troubled straw-coloured light imparts a ghastly hue to every object, and the mighty concavity of heaven seems as if it had been

lowered towards the earth ; the horizon, too, which looked at such an immeasurable distance, appears to approach, and the idea that fixes upon the mind of the traveller is that of being circumscribed within a narrowing boundary. The heat is then exceedingly great, and the east wind comes loaded with sand still further to bewilder him.

During the dry season great inconvenience is experienced in many parts of the Llanos from want of water. The streams dry up, and as in the North animals become torpid from excess of cold, here a similar effect is produced by heat, and the alligators and large serpents remain buried in the dried mud. Here also the deceitful mirage mocks the thirsty traveller, and both men and cattle are seen pressing forwards with breathless haste to quench their thirst in the supposed stream. Bitter is the disappointment ; and even when upon the brink, it is scarcely possible to dispossess the mind of the illusion ; while the poor harassed animals, unable to bear the tormenting thirst with which they are consumed, and bewildered by the clouds of sand, run bellowing with outstretched necks, and snuffing at the hot wind, as if they hoped to detect the scent of water from some distant pool. Night is even more intolerable than the day, for if the heat diminishes, still the suffering creation can scarcely enjoy the respite. Enormous bats attack those who fall asleep, and the punctures which they make are quickly resorted to by innumerable insects, who endeavour to deposit their eggs within them. While the earth is thus replete with suffering, the heavens are glorious, and blaze with the most

brilliant constellations. Thus all things continue till about the beginning of March, when the whole scene is quickly and strangely altered. The deep blue of the cloudless sky becomes less intense, and the stars, veiled at night by a slight vapour, lose the steady and planet-like light which before distinguished them; that black spot which gives so peculiar a character to the magnificent constellation of the Southern Cross is hardly perceptible; the vertical stars of the Eagle and Ophiuchus shine with a tremulous and diminished light, and by degrees the soft phosphorescent glimmer of the Magellanic clouds is extinguished. The fresh breeze which tempered the heat becomes at this period less strong and regular, and often ceases altogether for a considerable time. A few faint wandering clouds appear at intervals on the verge of the horizon, attended by misty vapours, which ascend, waving like banners, to the zenith; then huge mountain-clouds accumulate towards the south-south-east, now stationary and charged with electric fluid, and now traversing the heavens with a celerity that little corresponds with the feebleness of the warm wind that blows occasionally across the plain. As weeks pass on, and March is nearly over, the southern region of the atmosphere becomes illuminated by frequent gleams of lightning, and a brisk wind passes to the west and south-west. This is a sure indication of the rainy season, which commences at the Orinoco, and rapidly asserts its empire over the scorched earth. The sky assumes a gray tint instead of the brilliant azure which surpassed even that of an Italian sky; the heat gradually decreases,

and soon dense vapours obscure the magnificent concavity of heaven. Plaintive cries are now heard in various directions, as from those who mourn and bewail themselves. They are uttered by howling monkeys in the evening and before the dawn of day, and break upon the stillness of those wild solitudes; loud thunders, too, announce the approach of refreshing rains, which descend in torrents, and call forth a brilliant assemblage of grass and flowers.

The dry and dusty plains seem changed as if by a magic wand. Beautiful mimosas unfold their light green leaves in unison with the broad and ample blossoms of water-plants; creepers and tall shrubs, bright flowers, and waving grasses appear in mingled beauty; brilliant butterflies sport among them, and animals of all descriptions bound rejoicing amid the glowing scene. He who looks over the smiling landscape, and hears the cheerful songs of innumerable birds, who observes the beauty of the vegetable, and the joyousness of the animal creation, might be ready to exclaim, "Such was Eden!" But in the midst of all that is thus verdurous and joyful, death and misery abound. The spotted jaguar lurks in the tall herbage, and often darts, like the eastern tiger, upon the bounding antelope. He, too, who stops to gather a water-lily from the margin of some streamlet or inland lake, which reflects on its tranquil bosom the beautiful earth and sky, is often astonished by hearing a strange uncouth sound that precedes the breaking up of some near spots of earth, the clods of which are cast into the air with a noise resembling that of a mud volcano. This heaving of the earth announces the rising up of

some gigantic water-snake, or deadly crocodile, which has been roused from its torpor by the recent rains.

But soon, throughout a wide extent of country, the beauty and luxuriance of vegetation disappears. The rivers Apure, Payara, and Arauca, which form the southern boundary of the Llanos, overflow their banks, and render one part of the vast plains a lake, so deep and wide that large vessels often sail for many miles across the country. The joyous creatures which were seen so lately to luxuriate in the rich pasturage are now compelled to live as if amphibious. Those isolated banks which rise above the level of the plains become crowded with animals, but as the rapidly-increasing current soon encroaches upon them, the poor harassed creatures may be seen, now standing breast-deep in water, and cropping the grasses which still appear above the brown turbid stream, and now swimming, for hours together, in quest of some bank on which to secure themselves. Many of the young are drowned in consequence, and many are seized by the crocodiles, or injured by the blows of their jagged tails, while such as escape often bear about with them the marks inflicted by these rapacious animals.

Gradually as the waters rise, so gradually do they disappear. The sun re-enters the southern signs, and the current of air from the north sets in again; the rains quickly cease, and the gray canopy of clouds which so mercifully intercepted the rays of a vertical sun is soon withdrawn; they accumulate on the horizon in mountainous masses, and then disperse into light and floating forms; by de-

grees they are no longer seen, and the sky resumes its clearness and serenity.

Thus death and life succeed, and mournful scenes,
Obtrude by turns, amid the works of God.
His glorious works, of rolling clouds and showers,
Of winding rivers, forest trees, and dells,
Of healthful winds, and that gray screen of clouds,
Which shields the parched earth from heat extreme.
The one, from year to year, denotes the change,
The deathful change, that passed on this fair earth ;
The other speaks of that unchanging love
Which cares for man, and fruitful seasons still,
Seed-time and harvest, gives to all alike.

THE END.

LONDON:
JOHN W. PARKER, ST. MARTIN'S LANE.





